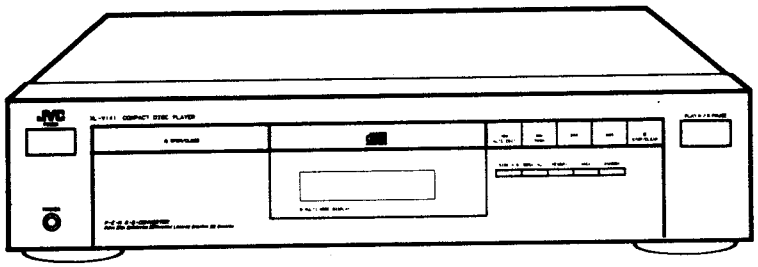
XL-V141TN
XL-V142BK

JVC

SERVICE MANUAL

XL-V141TN

MODEL NO. XL-V142BK



COMPACT disc DIGITAL AUDIO

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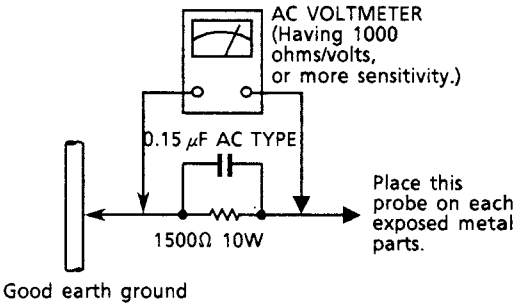
No. 20212
Dec. 1990

Safety Precautions

1. The design of this product contains special hardware and many circuits and components specially for safety purposes. For continued protection, no changes should be made to the original design unless authorized in writing by the manufacturer. Replacement parts must be identical to those used in the original circuits. Services should be performed by qualified personnel only.
2. Alterations of the design or circuitry of the product should not be made. Any design alterations of the product should not be made. Any design alterations or additions will void the manufacturer's warranty and will further relieve the manufacture of responsibility for personal injury or property damage resulting therefrom.
3. Many electrical and mechanical parts in the products have special safety-related characateristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in the Parts List of Service Manual. Electrical components having such features are identified by shading on the schematics and by (⚠) on the Parts List in the Service Manual. The use of a substitute repalcement which does not have the same safety characteristics as the recommended replacement parts shown in the Parts List of Service Manual may create shock, fire, or other hazards.
4. The leads in the products are routed and dressed with ties, clamps, tubings, barriers and the like to be separated from live parts, high temperature parts, moving parts and/or sharp edges for the prevention of electric shock and fire hazard. When service is required, the original lead routing and dress should be observed, and it should be confirmed that they have been retuned to normal, after re-assembling.
5. Leakage currnet check (Electrical shock hazard testing)
   After re-assembling the product, always perform and isolation check on the exposed metal parts of the product (antenna terminals, knobs, metal cabinet, screw heads, headphone jack, contorl shafts, etc.) to be sure the product is safe to operate without danger of electrical shock.
   Do not use a line isolation transformer during this check.
   - Plug the AC line cord directly into the AC outlet. Using a "Leakage Current Tester", measure the leakage current from each exposed metal parts having a return path to the chassis, to a known good earth ground. Any leakage current must not exceed 0.5mA AC (r.m.s.).
   - Alternate check method
     Plug the AC line cord directly into the AC outlet. Use an AC voltmeter having, 1,000 ohms per volt or more sensitivity in the following manner. Connect a 1,500Ω 10 W resistor paralleled by a 0.15 μF AC-type capacitor between an exposed metal part and a known good earth ground.
     Measure the AC voltage across the resistor with the AC voltmeter.
     Move the resistor connection to each exposed metal parts, particularly any exposed metal part having a return path to the chassis, and meausre the AC voltage across the resistor.
     Now, reverse the plug in the AC outlet and repeat each measurement. Any voltage measured must not exceed 0.75 V AC (r.m.s.). This corresponds to 0.5 mA AC (r.m.s.).



Warning

1. This equipment has been designed and manufactured to meet international safety standards.
2. It is the legal responsibility of the repairer to ensure that these safety standards are maintained.
3. Repairs must be made in accordance with the relevant safety standards.
4. It is essential that safety critical components are replaced by approved parts.
5. If mains voltage selector is provided, check setting for local voltage.

Important for Laser Products

1. CLASS 1 LASER PRODUCT
2. DANGER : Invisible laser radiation when open and interlock failed or defeated. Avoid direct exposure to beam.
3. CAUTION : There are no serviceable parts inside the Laser Unit. Do not disassemble the Laser Unit. Replace the complete Laser Unit if it malfunctions.
4. CAUTION : The compact disc player uses invisible laser radiation and is equipped with safety switches which prevent emission of radiation when the drawer is open and the safety interlocks have failed or are defeated. It is dangerous to defeat the safety switches.
5. CAUTION : If safety switches malfunction. the laser is able to function.
6. CAUTION : Use of controls, adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
7. CAUTION : The compact disc player provides a laser diode of wavelength 780-790nm and optical output power typical 3mW at the laser diode.

VARNING : Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.

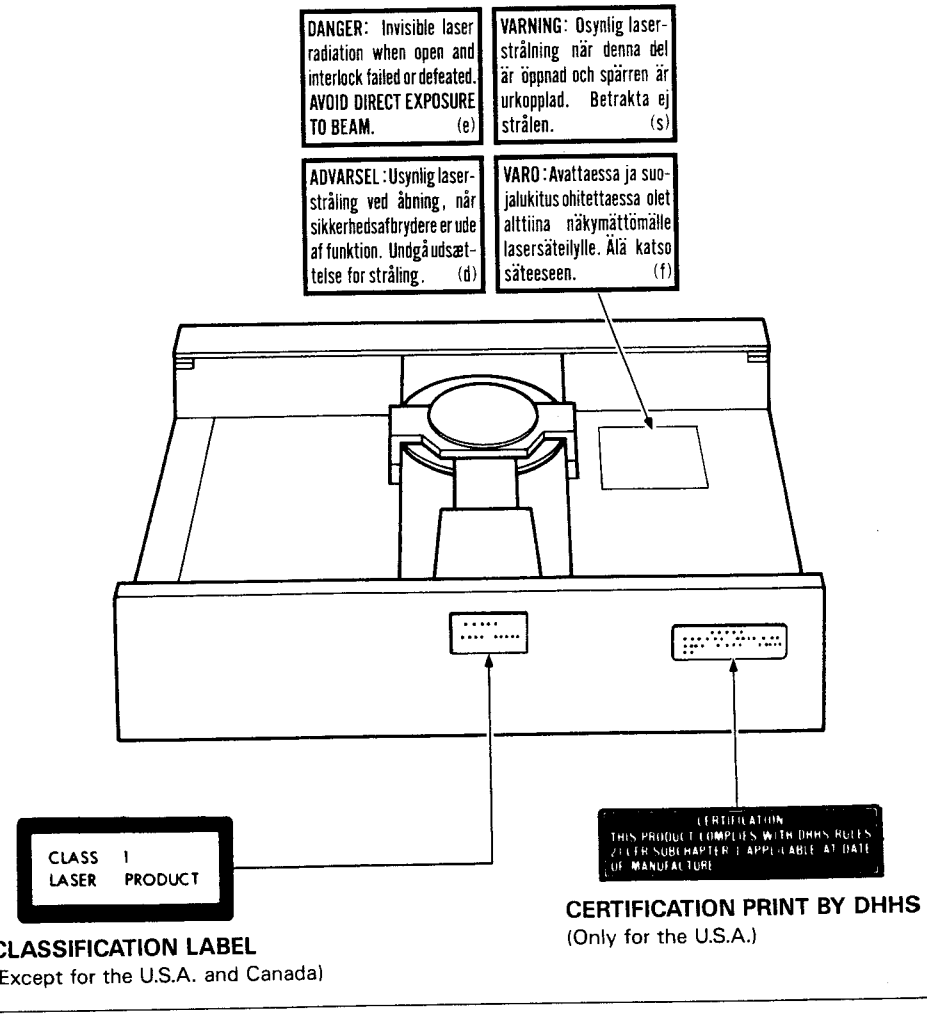
VARO : Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.

ADVARSEL : Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling.

ADVARSEL : Usynlig laserstråling ved åpning, når sikkerhetsbryteren er avslott. unngå utsettelse for stråling.

REPRODUCTION AND POSITION OF LABELS

WARNING LABEL
(Except for the U.S.A.)


DANGER: Invisible laser radiation when open and interlock failed or defeated. AVOID DIRECT EXPOSURE TO BEAM. (e)
VARNING: Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen. (s)
ADVARSEL: Usynlig laserstråling ved åbning, når sikkerhedsafbrydere er ude af funktion. Undgå udsættelse for stråling. (d)
VARO: Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen. (f)
CLASS 1
LASER PRODUCT
CERTIFICATION
THIS PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE

CLASSIFICATION LABEL
(Except for the U.S.A. and Canada)

CERTIFICATION PRINT BY DHHS
(Only for the U.S.A.)

COMPU LINK CONTROL SYSTEM

This is a convenient system which was originated and developed by JVC. The following is a brief explanation of its major points.

Automatic Source Selection
When the provided remote cables are used for connecting this unit to other components which have COMPU LINK-1/SYNCHRO terminals, the switch-over of all system components is possible with simple one-touch of the source selector button of the JVC amplifier or receiver. By doing this, the corresponding component will start playing automatically. The source select button of the remote control unit or the select button of the desired component can also be used for this purpose.
When the components have been switched over, the previously used component will stop playing within five seconds.

Synchronized Recording
If a cassette deck with COMPU LINK-1/SYNCHRO terminals is connected with the remote cable supplied, synchro recording becomes possible.
Synchronized recording refers to the process in which the cassette deck starts recording in synchronism with the CD player. Perform the synchronized recording as follows.

1. Set the cassette deck to the REC/PAUSE mode in accordance with the procedures in the instructions.
2. If you want programmed recordings, program the desired selections in any order you wish to hear them.
3. Press the [PLAY (▶)] button of the CD player. By so doing, the cassette deck is placed in the record mode and synchronized with the CD player for recording. Synchronized recording thus can be made possible.

Notes:
- **Synchronized recording stops automatically when the CD player stops playing.**
- **To cancel synchronized recording, press the [STOP (■)] button of the CD player or cassette deck.**

CAUTION:
- **When the REC/PAUSE mode is set by pressing [PAUSE (⏸)] button after pressing the [REC (○)] and [PLAY (▶)] buttons simultaneously, synchronized recording is not possible. For details, refer to the instructions of the cassette deck.**
- **Abnormal operation will result if the power supply of the component(s) is interrupted. If this happens, you must start all over again.**
- **Ensure that the COMPU LINK-1/ SYNCHRO terminals of the individual components are connected with the provided remote cables. Also be sure to fully read the instructions for each component.**

BEFORE USE

The service life of the batteries depends on the condition of use; the standard life is about one year.
When the batteries become weak, the effective distance of the remote control unit will become shorter. If this happens, replace the batteries with new ones.

- **How to install batteries (for XL-V241TN/XL-V242BK only)**

1. Remove the rear cover of the remote control unit by pressing down on it with your thumb and simultaneously pulling it backwards, as shown in Fig. 3.

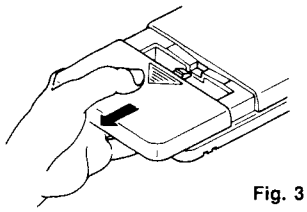


Fig. 3

2. Install batteries (AAA, R03, UM-4) as shown in Fig. 4.
Be sure batteries are installed with correct polarity, (+) and (−).

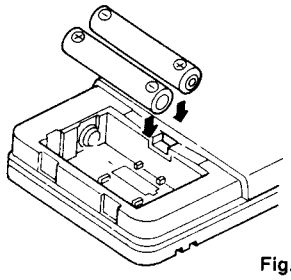


Fig. 4

3. Reinstall the rear cover of the remote control unit. Slide the rear cover back as shown in Fig. 5.

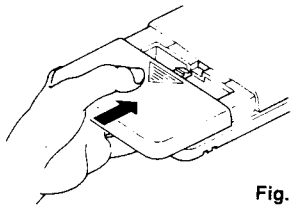


Fig. 5

Notes:
- **The lower the temperature, the shorter the battery life.**
- **Battery replacement.**

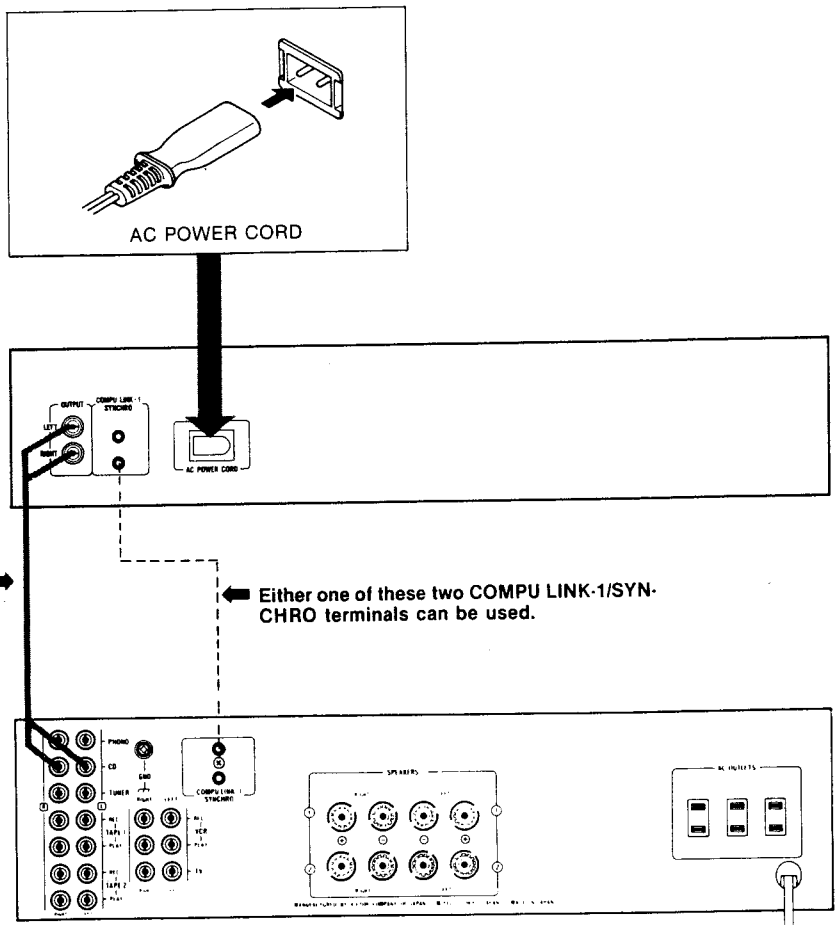
- **Batteries**

Incorrect use of batteries can cause corrosion or damage. Note the following points to lengthen battery life.

1. Install batteries observing the correct polarity, (+) and (−).
2. Do not use new and old batteries simultaneously.
3. Batteries with similar shapes may have different voltage ratings. Be sure to use the correct batteries.
4. Remove batteries from the remote control unit if it will not be used for a long period of time.

CONNECTION DIAGRAM

- Do not connect the power plug unless all the connection is completed.
- Connect the plugs firmly.
- The synchronized recording is only possible with JVC products which have the COMPU LINK-1/SYNCHRO terminals. For further details, consult your JVC dealer.


AC POWER CORD
This cord is designed to connect the DAD, CD, or AUX terminals. Do not connect this cord to the PHONO terminals of the amplifier.
Either one of these two COMPU LINK-1/SYNCHRO terminals can be used.

An example of an amplifier

Fig. 6

DESCRIPTION AND FUNCTIONS

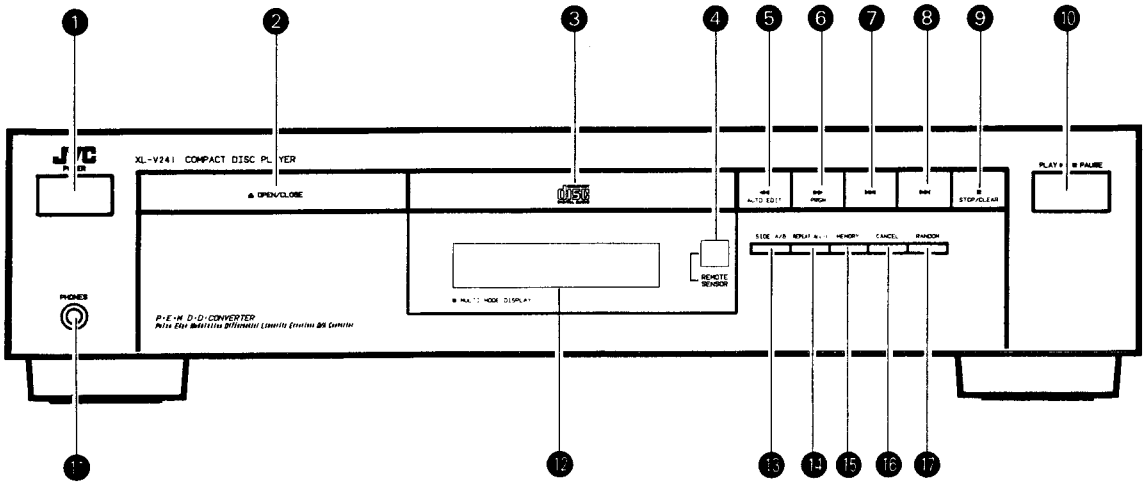


Fig. 7

❶ **POWER**
Press to turn on the power, the display will light. Press again to turn the power off. The display will go off.
A small amount of power (2 watts) is consumed in the standby mode. To turn the power off completely, disconnect the power cord from the wall outlet.

❷ **OPEN/CLOSE (▲)**
Press to move the disc platter in and out. Press once and the disc platter will move out; now you can load a disc. Press again to move the platter back in. The disc is now ready to be played.
If it is pressed during play, play will be interrupted. And the program will be erased from memory and the disc platter will come out.

❸ **Disc Platter**
Load the disc to be played.

❹ **REMOTE SENSOR**
(XL-V241TN/XL-V242BK only)

❺ **AUTO EDIT (◀◀)**
When this button is pressed in the standby mode, the CD player will be ready to begin the auto edit recording. "EDIT AUTO" will light in the MULTI MODE DISPLAY.
When this button is pressed during play or pause mode, the CD player will begin to scan backwards. In such a case, when the button is kept pressed, the CD player will backward-search slowly for about 3 seconds, and then go into a higher speed search.

❻ **PRGM EDIT (▶▶)**
When this button is pressed in the standby mode, the CD player will be ready to begin the program edit recording. "EDIT PRGM" will light in the MULTI MODE DISPLAY.
When this button is pressed during play or pause mode, the CD player will begin to scan forward. In such a case, when the button is kept pressed, the CD player will forward-search slowly for about 3 seconds and then go into a higher speed search.

❼ **(I◀◀)**
Press this button to locate the start of the current selection or to go back to the previous selection during play. Play will go back one selection each time the button is pushed. If the button is held down, play will continue to go back one selection at a time until the button is released.

❽ **(▶▶I)**
Press to go to the start of the next selection. Every time this button is pressed, the pickup goes forward by one selecion. Holding the button down moves the pickup forward continuously.

❾ **STOP/CLEAR (■)**
Press to stop play. A few seconds after the disc has stopped rotating, the player goes into the standby mode with the track number "1" shown in the display window. The player is then ready to play.

❿ **PLAY ▶/ II PAUSE**
Press to start play. If the disc platter is out, press this button, and the disc platter will then move in and play will start (without pressing the [OPEN/CLOSE (▲)] button.)
Press this button again to suspend play temporarily. The optical pickup stops and the disc continues to rotate. This status is called the pause mode.

⓫ **PHONES**

⓬ **Display Window (MULTI MODE DISPLAY)**
This shows the total number of selections on the disc, the total playing time, the elapsed playing time, the remaining playing time, various program data, etc. For more details, see "DISPLAY" on page 6.

⓭ **SIDE A/B**
Use this button to designate the tape side when programming for edit recording.

⓮ **REPEAT ALL/1**
Press this button to play one selection, all the selections or the programmed selections of the disc repeatedly.
When desiring all the selections, press the button once. "REPEAT" will be lit in the display window. When desiring one selection, press the button once again. "1" and "REPEAT" will be lit in the display window. To release this repeat play, press the [REPEAT ALL/1] button again.

⓯ **MEMORY**
To memorize the sequence of the selections to be played, press this button while the CD player is in the standby mode. The PROGRAM indicator lights and up to 32 selections can be memorized.

⓰ **CANCEL**
Press this button to cancel a programmed tune, Each time it is pressed, one tune is cancelled.

⓱ **RANDOM**
When this button is pressed, the CD player will be ready for random play.

DISPLAY

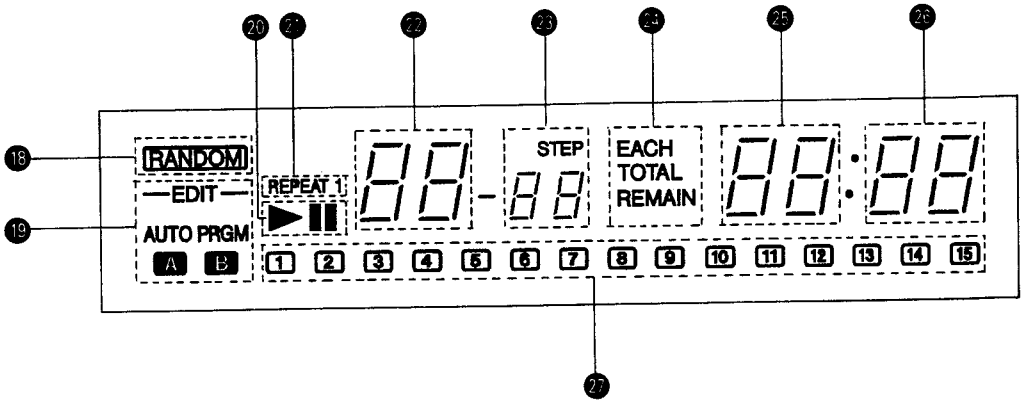


Fig. 8

⑲ **RANDOM**
Lights in RANDOM MODE.

⑱ **EDIT**
Lights during editing recording.
[EDIT AUTO]: Lights during Auto Edit Recording.
[EDIT PRGM]: Lights during Program Edit Recording.
[A] : Lights when the A side of the tape is designated.
[B] : Lights when the B side of the tape is designated.

⑳ **PLAY/PAUSE indicators**
▶ : Lights during play.
II : Lights in the pause mode.

㉑ **REPEAT**
Lights when the repeat play is ready.
REPEAT : Lights when the repeat play of all the selections is entered.
REPEAT 1: Lights when the repeat play of only one selection is entered.

㉒ **TRACK**
Lights when all the selections of the disc are shown.
Shows the programmed selection numbers or the current selection number of the disc during programmed play.

㉓ **STEP**
Shows the numbers of memory steps of the programmed selections.

㉔ **EACH/TOTAL/REMAIN**
EACH : Shows elapsed time for each selection.
EACH REMAIN : Shows the playing time for the first selection in the standby mode.
TOTAL : Shows the total playing time for the disc and for the programmed selections.
TOTAL REMAIN : Shows the remaining playing time for the programmed selections during edit recording.
REMAIN: Shows the remaining time for the cassette tape during edit recording. (The excess programming time will blink.)

㉕ **Time indicator (MINUTE)**
Shows the total playing time, elapsed playing time, or remaining playing time in minutes.

㉖ **Time indicator (SECOND)**
Shows the total playing time, elapsed playing time, or the remaining playing time in seconds.

㉗ **Program Chart**
This chart indicates the number of each selection on the disc.
When a selection is programmed, the selection number lights.

HOW TO OPERATE

Preliminary Operation

1. Turn on and adjust components such as an amplifier.
2. Turn on the CD player.
3. Press the [OPEN/CLOSE (≜)] button to slide the disc platter out.
4. With its label side up, load a disc on the CD player.
5. Press the [OPEN/CLOSE (≜)] button again to slide the disc platter in.

Notes:

- **The display shows the number of tracks and total playing time of the disc for 3 seconds.**
- **You can also close the disc platter by pressing the [PLAY ▶/ ⏸ PAUSE] button. In such a case, play starts immediately with the first selection of the disc.**

To Play From the First Selection

Press the [PLAY ▶/ ⏸ PAUSE] button.

To Play From Any Desired Selection

1. Designate the desired selection number by the [(▶▶|)] button.
2. Press the [PLAY ▶/ ⏸ PAUSE] button.

To Stop Play Temporarily

Press the [PLAY ▶/ ⏸ PAUSE] button.

Note:

- **To continue playing, press the [PLAY ▶/ ⏸ PAUSE] button again.**

To Switch Selections During Play

- **To skip to the next selection**
  Press the [(▶▶|)] button.
- **To skip to the previous selection**

1. Press the [(|◀◀)] button once and locate the start of the current selection.
2. Immediately after step 1, press the [(|◀◀)] button again.

To Repeat Play

- **To repeat all the selections**

1. Press the [REPEAT ALL/1] button once.
2. Press the [PLAY ▶/ ⏸ PAUSE] button.

- **To repeat one selection**

1. Press the [REPEAT ALL/1] button twice.
2. Designate the desired selection number by the [AUTO SEARCH (▶▶|)] buttons.
3. Press the [PLAY ▶/ ⏸ PAUSE] button.

To Stop Play

Press the [STOP/CLEAR (■)] button.

To Remove the Disc

Press the [OPEN/CLOSE (≜)] button.

To Program Play

1. Press the [STOP/CLEAR (■)] button.
2. Select the track(S) you want to program by using [(|◀◀ , ▶▶|)] button.
3. Press the [MEMORY] button.
4. Press the [PLAY ▶/ ⏸ PAUSE] button.

Notes:

- **A maximum of 32 out of 99 tunes can be selected.**
- **When the programmed play is performed, the selection number programmed first and the total playing time of programmed selections are displayed.**
- **The total playing time display is useful when making recordings from the CD player.**
- **When programming is carried out with the disc platter out, the total playing time of the programmed selections will not be displayed.**
- **When the total playing time of all the selected tunes exceeds 99 minutes and 59 seconds, the time display will be disabled and only the center bar will be displayed.**
- **Pressing the [(▶▶|)] button when in the programmed play or pause mode causes the unit to skip to the next programmed selection.**
- **To stop temporarily during programmed play, press the [PLAY ▶/ ⏸ PAUSE] button. Press this button again to restart.**

To Random Play

1. Press the [STOP/CLEAR (■)] button.
2. Press the [RANDOM] button.
3. Press the [PLAY ▶] button.

To Cancel the part of Random Play

1. Select the track(s) you want to cancel using the [(|◀◀ , ▶▶|)] button.
2. Press the [CANCEL] button.

To add canceled track(s) to Random Play

1. Select the canceled track(s) you want to add to Random Play using the [(|◀◀ , ▶▶|)] button.
2. Press the [MEMORY] button.

To Correct the Program

- **To correct all the program**

1. Press the [STOP/CLEAR (■)] button.
2. Start programming again from the beginning.

- **To correct each content of the program during programming**

Press the [CANCEL] button.
Each time it is pressed, one tune is cancelled starting from the last tune.

To Perform Synchronized Recording

Synchronized recording is possible by connecting the cassette deck to the COMPU LINK-1/SYNCHRO terminals of the CD player through the remote cable.

1. Press the [REC (○)] and [PAUSE (⏸)] buttons of the cassette deck.
2. Press the [PLAY ▶/ ⏸ PAUSE] button of the CD player to start the synchronized recording.
3. Press the [STOP/CLEAR (■)] button to stop recording.

To Perform Edit Recording

Auto Edit Recording

Automatically distributes and edits the tracks accommodated within the specified time to sides A and B.

1. Set a disc and press the [STOP/CLEAR (■)] button.
2. Press the [AUTO EDIT (◀◀)] button.
   - A flashing indicator suggests the tape length fit to the disc mounted.
   - Each time you press the [AUTO EDIT (◀◀)] button, the flashing tape length indicator will change in the following sequence.

   C46 → C54 → C60 → C74 → C90

   Press the [AUTO EDIT (◀◀)] button to meet the length of the tape you have loaded.
3. Press the [SIDE A/B] button to select between sides A and B of the tape.
   - The selections to enter side A or B are programmed automatically.
4. Place the cassette deck in REC PAUSE mode.
   This operation is limited to the units using JVC's COMPU LINK system. For other cassette deck, set the deck in recording status before pressing the [PLAY ▶/ ⏸ PAUSE] button.
5. Press the [PLAY ▶/ ⏸ PAUSE] button.
   When the last selection programmed on the A side of the tape ends, the edit recording automatically stops. To record in the other side of the tape, repeat the steps 4 and 5 after turning over the tape.

HOW TO OPERATE

Program Edit Recording
Edits the tracks accommodated within the specified time in the desired track order.

1. Set a disc and press the [STOP/CLEAR (■)] button.
2. Press the [PRGM EDIT (▶▶)] button.
   - A flashing indicator suggests the tape length fit to the disc mounted.
   - Each time you press the [PRGM EDIT (▶▶)] button, the flashing tape length indicator will change in the following sequence.

     C46 → C54 → C60 → C74 → C90

   - Press the [PRGM EDIT (▶▶)] button to meet the length of the tape you have loaded.
3. Press the [SIDE A/B] button to select between sides A and B of the tape.
   - The maximum duration of recording permitted on one side is displayed.
4. Program a selection you want to record with the [(⏮ , ⏭)] button.
5. Press the [PROGRAM] button.
6. Repeat the steps 4 and 5 to program other selections.
7. After you finish the programming of the A side of the tape, press the [SIDE A/B] button.
8. Repeat the steps 4, 5 and 6.
9. Place the cassette deck in REC PAUSE mode.
   This operation is limited to the units using JVC's COMPU LINK system. For other cassette deck, set the deck in recording status before pressing the [PLAY ▶/ ⏸ PAUSE] button.
10. Press the [PLAY ▶/ ⏸ PAUSE] button.
    When the last selection programmed on the A side of the tape ends, the edit recording automatically stops. To continue edit recording, turn over the tape and then repeat the steps 3, 9 and 10 again.

Notes:
- **When the programming is in excess of the designated time interval, the excess time blinks in the display. In such a case, press the [CANCEL] button to cancel the last programmed selection.**
- **To cancel the editing status, press the [STOP/CLEAR (■)] button twice.**

TROUBLESHOOTING

What appears to be malfunction may not always be serious. Go through the following list before requesting service.

Sympton	Possible causes	Remedy
When the operating buttons are pushed nothing happens.	• The operating controls are being pressed too quickly and repeatedly.	• Switch the power off and on again.
A selection on a CD was not played.	• A CD is missing. • A CD is upside-down.	• Load the missing CD. • Reload the CD, label-side up, on the disc tray.
Programming is not possible.	• The PROGRAM indicator is not switched on.	• Light the indicator by pressing the [PROGRAM] button on remote control unit. Please see "How to Programme and Play", on page 8.
The sound is intermittent and difficult to listen to.	• The CD is dirty. • The CD is scratched. • The CD is warped.	• Wipe the surface of the CD with a soft, dry cloth. • Replace the damaged CD with a new one. • Never bend or heat a CD with hair drier, or anything similar.
A CD won't play.	• The CD is disengaged from the disc tray.	• Switch the power off and on again.

SPECIFICATIONS

XL-V141TN/XL-V142BK

System	: Compact disc player
Signal detection system	: Non-contact optical system
Number of channels	: 2 channels
Frequency response	: 2 Hz – 20,000 Hz
Dynamic range	: 98 dB (1 kHz)
Signal/noise ratio	: 104 dB (at digital 0)
Channel separation	: 94 dB (1 kHz)
Harmonic distortion	: 0.0025% (1 kHz)
Wow and flutter	: Less than measurable limit
Output level	: 2.0 Vrms (full scale)
Number of program steps	: 32 steps
Line Voltage & Frequency	: AC 120V ∿, 60 Hz
Power Consumption	: 11 watts
Dimensions	: 435(W) × 102(H) × 274(D)mm (17-3/16″ × 4-1/16″ × 10-3/16″)
Weight	: 3.5 kg (7.8 lbs)
Accessories	: Signal cord (1 m • 3.28 ft) . . . . 1 Remote cable (1 m • 3.28 ft) 1

Design and specifications subject to change without notice.

Description of Major LSIs

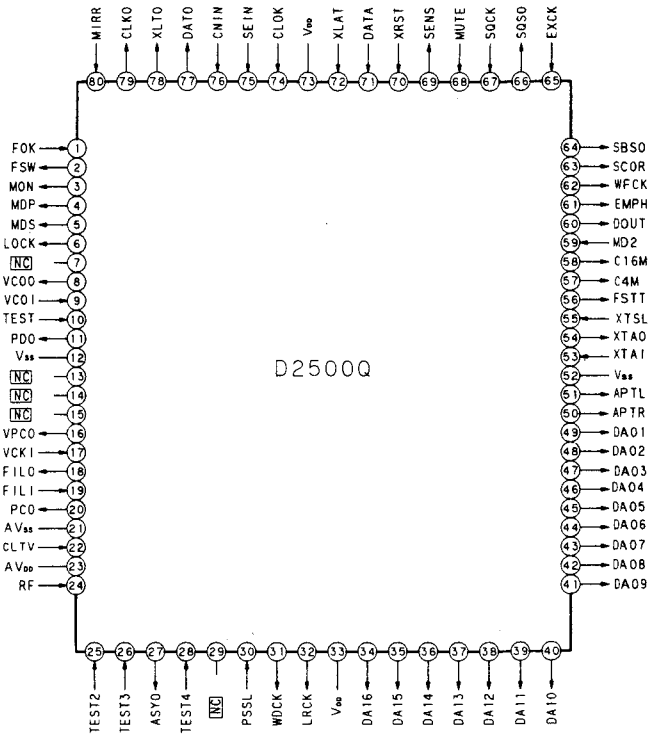
■ CXD2500Q (IC401) · · · · DIGITAL SIGNAL PROCESSOR

1. Outline

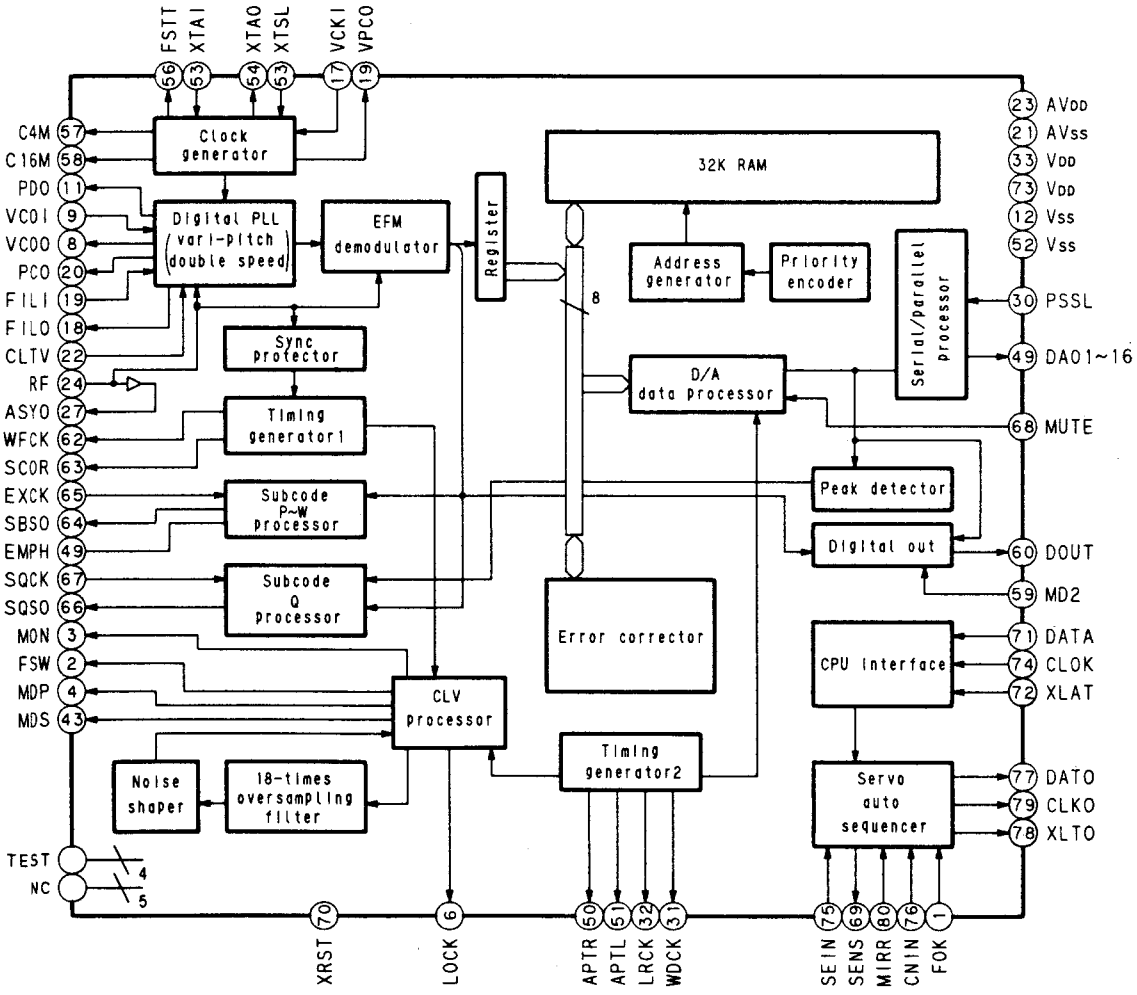
The CXD2500Q is a digital signal processing LSI designed for use in compact disc players. It has the following functions:

- All digital signals for regeneration are processed using one chip.
- The built-in RAM enables high-integration mounting.
- Generation by the use of a digital PLL of bit clock pulses for strobing the EFM signal.
- EFM data demodulation
- Subcode demodulation and subcode Q data error detection
- Digital spindle servo system (incorporating an oversampling filter)

2. Terminal Layout



3. Internal Block Diagram



4. Pin Description

Pin No.	Symbol	I/O		Description
1	FOK	I		Focus OK input pin. Used for SENS output and servo auto sequencer.
2	FSW	O	Z.0	Output used to switch the spindle motor output filter.
3	MON	O	1.0	Output for spindle motor ON/OFF control
4	MDP	O	1,Z,0	Output for spindle motor servo control
5	MDS	O	1,Z,0	Output for spindle motor servo control
6	LOCK	O	1,0	The output of this pin is "H" when the GFS signal sampled at 460Hz is "H". It turns "L" when the GFS signal turns out "L" 8 or more times in succession.
7	NC	———		
8	VCOO	O	1,0	Output of oscillation circuit for analog EFM PLL
9	VCOI	I		Input to oscillation circuit for analog EFM PLL. f_{LOCK}=8.6436MHz
10	TEST	I		Test pin. Normally at 0V (GND).
11	PDO	O	1,Z,0	Output of charge pump for analog EFM PLL
12	V_{SS}			GND
13	NC	———		
14	NC	———		
15	NC	———		
16	VPCO	O	1,Z,0	Output of charge pump for vari-pitch PLL
17	VCKI	O		Clock input from external VCO for vari-pitch control. fc_{center}=16.9344MHz
18	FILO	O	Analog	Output of filter for master PLL (Slave=Digital PLL)
19	FILI	I		Input to filter for master PLL
20	PCO	O	1,Z,0	Output of charge pump for master PLL
21	AV_{SS}			Analog GND
22	CLTV	I		VCO control voltage input for master PLL
23	AV_{DD}			Analog power supply (+5V)
24	RF	I		EFM signal input
25	TEST2	I		GND
26	TEST3	I		GND
27	ASYO	O	1,0	EFM full-swing output
28	TEST4	I		GND
29	NC	———		
30	PSSL	I		Input used to switch the audio data output mode. "L" for serial output, "H" for parallel output.
31	WDCK	O	1,0	D/A interface for 48-bit slot. Word clock f=2Fs
32	LRCK	O	1,0	D/A interface for 48-bit slot. LR clock f=Fs
33	V_{DD}			Power supply (+5V)
34	DA16	O	1,0	Outputs DA16(MSB) when PSSL=1 or serial data from 48-bit slot (2's complements, MSB first) when PSSL=0.
35	DA15	O	1,0	Outputs DA15 when PSSL=1 or bit clock from 48-bit slot when PSSL=0.

Pin No.	Symbol	I/O		Description
36	DA14	O	1,0	Outputs DA14 when PSSL=1 or serial data from 64-bit slot (2's complements, LSB first) when PSSL=0.
37	DA13	O	1,0	Outputs DA13 when PSSL=1 or bit clock from 64-bit slot when PSSL=0.
38	DA12	O	1,0	Outputs DA12 when PSSL=1 or LR clock from 64-bit slot when PSSL=0.
39	DA11	O	1,0	Outputs DA11 when PSSL=1 or GTOP when PSSL=0.
40	DA10	O	1,0	Outputs DA10 when PSSL=1 or XUGF when PSSL=0.
41	DA09	O	1,0	Outputs DA9 when PSSL=1 or XPLCK when PSSL=0.
42	DA08	O	1,0	Outputs DA8 when PSSL=1 or GFS when PSSL=0.
43	DA07	O	1,0	Outputs DA7 when PSSL=1 or RFCK when PSSL=0.
44	DA06	O	1,0	Outputs DA6 when PSSL=1 or C2PO when PSSL=0.
45	DA05	O	1,0	Outputs DA5 when PSSL=1 or XRAOF when PSSL=0.
46	DA04	O	1,0	Outputs DA4 when PSSL=1 or MNT3 when PSSL=0.
47	DA03	O	1,0	Outputs DA3 when PSSL=1 or MNT2 when PSSL=0.
48	DA02	O	1,0	Outputs DA2 when PSSL=1 or MNT1 when PSSL=0.
49	DA01	O	1,0	Outputs DA1 when PSSL=1 or MNT0 when PSSL=0.
50	APTR	O	1,0	Control output for aperture correction. "H" for R-ch.
51	APTL	O	1,0	Control output for aperture correction. "H" for L-ch.
52	V_{SS}			GND
53	XTAI	I		Input to 16.9344MHz Xtal oscillation circuit or 33.8688MHz input
54	XTAO	O	1,0	Output of 16.9344MHz Xtal oscillation circuit
55	XTSL	I		Xtal selection input pin. "L" for 16.9344MHz Xtal, "H" for 33.8688MHz Xtal.
56	FSTT	O	1,0	2/3 divided output of pins 53 or 54. Unaffected by vari-pitch control.
57	C4M	O	1,0	4.2336MHz output. Subject to vari-pitch control.
58	C16M	O	1,0	16.9344MHz output. Subject to vari-pitch control.
59	MD2	I		Digital-Out ON/OFF control. "H" for ON, "L" for OFF.
60	DOUT	O	1,0	Digital-Out output pin
61	EMPH	O	1,0	Stays "H" for regeneration disc provided with emphasis or "L" for that without emphasis.
62	WFCK	O	1,0	WFCK(Write Frame Clock) output
63	SCOR	O	1,0	Turns "H" when subcode Sync S0 or S1 is detected.
64	SBSO	O	1,0	Serial output of Sub P to W
65	EXCK	I		Clock input for reading SBSO
66	SQSO	O	1,0	Outputs 80-bit Sub Q and 16-bit PCM peak-level data.
67	SQCK	I		Clock input for reading SQSO
68	MUTE	I		"H" for muting, "L" for release.
69	SENS	—	1,Z,0	SENS output to CPU
70	XRST	I		System reset. "L" for resetting.
71	DATA	I		Inputs serial data from CPU.
72	XLAT	I		Latches serial data input from CPU at falling edge.

Pin No.	Symbol	I/O		Description
73	V_{DD}			Power supply (+5V)
74	CLOK	I		Inputs serial data transfer clock from CPU.
75	SEIN	I		Inputs SENSE from SSP.
76	CNIN	I		Inputs track jump count signal.
77	DATO	O	1,0	Outputs serial data to SSP.
78	XLTO	O	1,0	Latches serial data output to SSP at falling edge.
79	CLKO	O	1,0	Outputs serial data transfer clock to SSP.
80	MIRR	I		Inputs mirror signal to be used by auto sequencer when jumping 128 or more tracks.

Notes:
- The data at the 64-bit slot is output in 2's complements on an LSB-first basis. The data at the 48-bit slot is output in 2's complements on an MSB-first basis.
- GTOP monitors the state of Frame Sync protection. ("H": Sync protection window released)
- XUFG is a negative Frame Sync pulse obtained from the EFM signal before Frame Sync protection is effected.
- XPLCK is an inversion of the EFM PLL clock. The PLL is designed so that the falling edge of XPLCK coincides with a change point of the EFM signal.
- The GFS signal turns "H" upon coincidence between Frame Sync and the timing of interpolation protection.
- RFCK is a signal generated at 136-μs periods using a crystal oscillator.
- C2PO is a signal to indicate a data error.
- XRAOF is a signal issued when a jitter margin of $\pm$28F is exceeded by the 32K RAM.
- Z in the I/O column means high impedance.

■ CXA1372S (IC601) · · · · RF SIGNAL PROCESSING SERVO AMPLIFIER

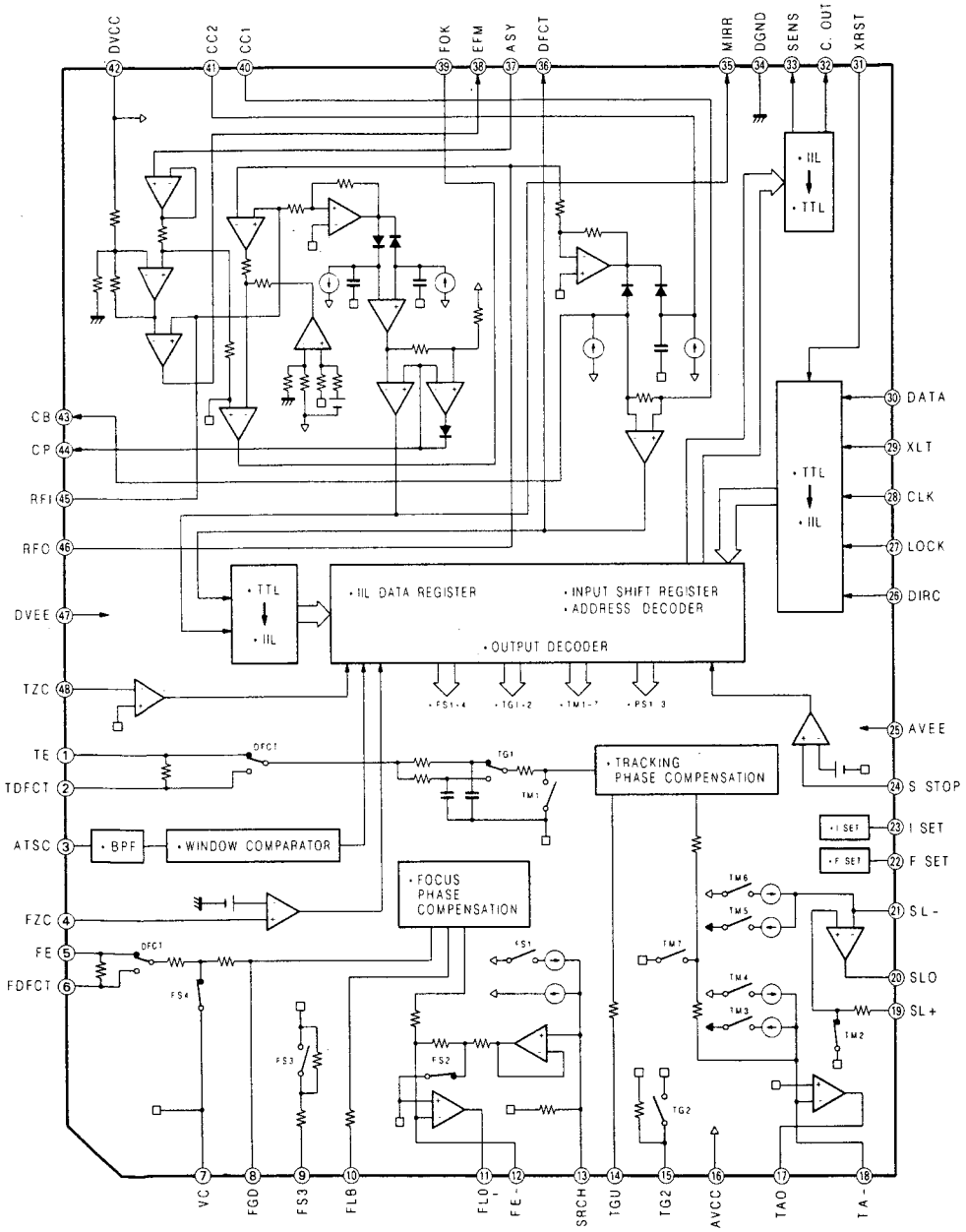
1. Outline

The CXA1372 is a bipolar IC developed for RF signal processing (focus OK, mirror, defect detection, EFM comparator) and servo control.

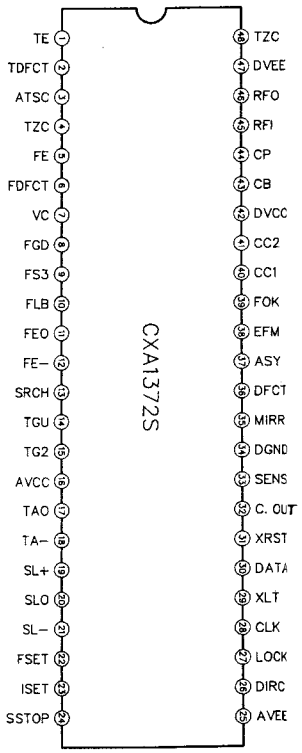
Functions

- Auto asymmetry control
- Focus OK detection circuit
- Mirror detection circuit
- Defects detection, counter measures circuit
- EFM comparator
- Focus servo control
- Tracking servo control
- Sled servo control

2. Internal Block Diagram



3. Terminal Layout



4. Pin Discription

Pin No.	Symbol	I/O	Description
1	TE	I	Input pin of tracking error amplifier.
2	TDFCT	I	Capacitor connecting pin for time constant during defects.
3	ATSC	I	Window comparator input pin for ATSC detection.
4	FZC	I	Pin for focus zero-cross comparator input.
5	FE	I	Input pin of focus error.
6	FDFCT	I	Capacitor connecting pin for time constant during defect functions.
7	VC	I	Center voltage input pin. For dural power: GND For single power supply: (Vcc + GND)/2
8	FGD	I	Connect a capacitor between this pin and pin 3 to reduce high-frequency gain.
9	FS3	I	The high-frequency gain of the focus servo is switched through FS3 ON and OFF.
10	FLB	I	Time constant external pin to raise the low bandwidth of the focus servo.
11	FEO	O	Focus drive output.
12	FE−	I	Inverse input pin for focus amplifier.
13	SRCH	I	Time constant external pin for the formation of focus search waveforms.
14	TGU	I	Time constant external pin for the selection of tracking high band gain.
15	TG2	I	Time constant external pin for the selection of tracking high band gain.
17	TAO	O	Tracking drive output.
18	TA−	I	Inverse input pin for tracking amplifier.
19	SL+	I	Non-inverse input pin for sled amplifier.
20	SLO	O	Sled drive output.
21	SL−	I	Inverse input pin for sled amplifier.
22	F SET	I	Pin to set peak frequency of focus tracking phase compensation and fo of CLV LPF.
23	I SET	I	Current is input to determine focus search, track jump, and sled kick height.
24	S STOP	I	Limit SW ON/OFF signal detection pin for disc inner periphery detection.
26	DIRC	I	Pin for one-track jump. Contains a 47 kΩ pull-up resistor.
27	LOCK	I	At "L" sled runaway prevention circuit operates. Contains a 47 kΩ pull-up resistor.
28	CLK	I	Serial data transfer clock input from CPU.
29	XLT	I	Latch input from CPU.
30	DATA	I	Serial data input from CPU.
31	XRT	I	Reset input pin, reset at "L".
32	SENS	O	Outputs FZC, AS, TZC and S STOP through command from CPU.
33	C.OUT	O	Track number count signal output.
35	MIRR	O	MIRR comparator output pin.
36	DFCT	O	Output pin of DEFECT comparator.
37	ASY	I	Input pin of auto asymmetry control.
38	EFM	O	Output pin of EFM comparator.
39	FOK	O	Output pin of FOK comparator.
40	CC1	I	Output pin of DEFECT bottom hold.
41	CC2	O	Input pin for the capacitance coupled output of DEFECT bottom hold.
43	CB	I	Connection pin of DEFECT bottom hold capacitor.
44	CP	I	Connecting pin of MIRR hold condenser. Non-inverted input pin of MIRR comparator.
45	RFI	I	Input pin with coupling capacitor where RF summing amplifier output is connected.
46	RFO	O	Output pin of RF summing amplifier and check point of eye pattern.
48	TZC	I	Input pin of tracking zero-cross comparator.

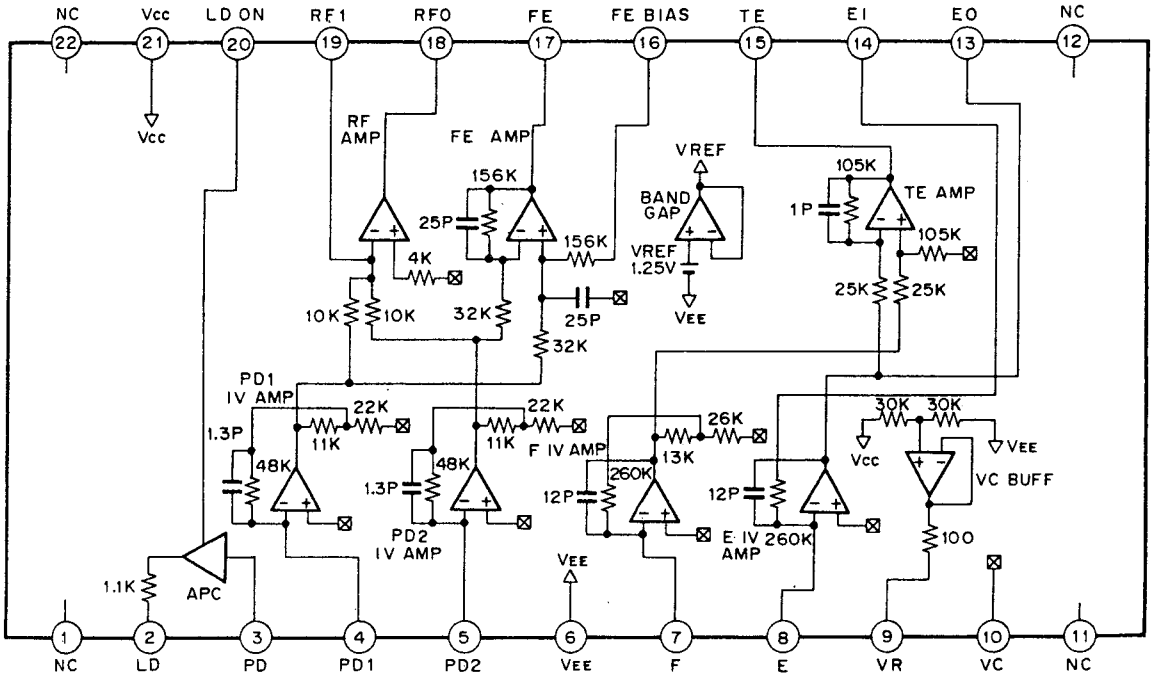
■ CXA1471S (IC501) · · · · RF AMP FOR COMPACT DISC

1. Outline

The CXA1471S IC for compact disc 3-point method optical pickup output has the following functions.

• RF amp • Focus error amp • Tracking error amp • APC circuit

2. Internal Block Diagram



3. Pin Discription

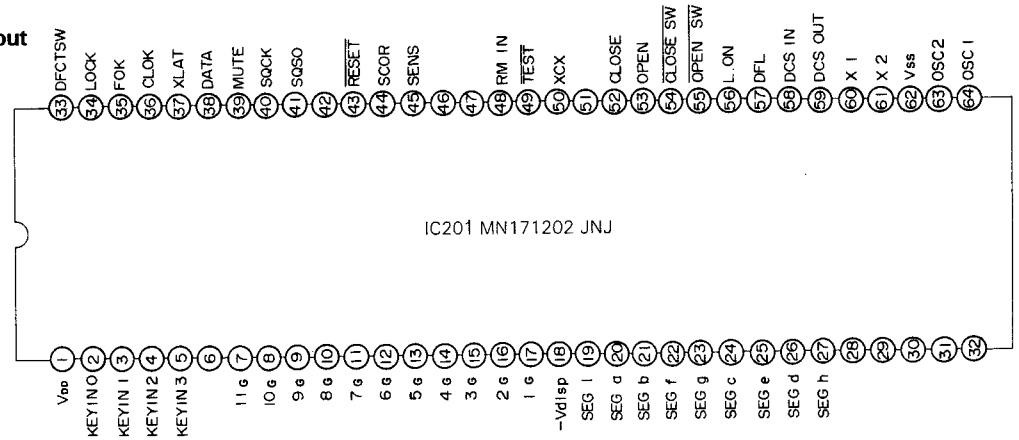
Pin No.	Symbol	I/O	Description
2	LD	O	APC amp output pin.
3	PD	I	APC amp input pin.
4 5	PD1 PD2	I I	RF I-V amp inverted input pins; they are connected to the A+C and B+D pins of the photodiode and receive current input.
7 8	F-IN E-IN	I I	F and E I-V amp inverted input pins; they are connected to Photodiodes F and E and receive current input.
9	VR	O	(Vcc+VEE)/2 DC voltage output pin.
10	VC	I	VC intermediate voltage input pin; when dual ±5V power supplies are used, this pin is connected to ground; for a single +5V power supply, it is connected to the VR pin.
13	EO	O	Monitor output pin for I-V amp E.
14	EI	I	Gain adjustment pin for I-V amp E.
15	TE	O	Tracking error amp output pin.
16	FE-BIAS	I	Bias adjustment pin for the non-inverted side of the focus error amp.
17	FE	O	Focus error amp output pin.
18	RF O	O	RF amp output pin.
19	RF I	I	RF inverted side input pin; the resistor connected between this pin and the RFO pin determines the gain of the RF amp.
20	LD-ON	I	This pin switches the APC amp on/off: on for Vcc, off for ground.

■ MN171202JNJ (IC201) · · · · MICRO COMPUTER

1. Outline

This LSI is a high-speed 4-bit single-chip microcomputer. It comprises 12 Kwords of ROM, 992 words × 4 bits of RAM, input/output ports, an 8-bit timer/counter, a time base counter, interrupt handling, etc. Its main functions are input from mechanical switches and control and issuing operating instructions to the CXD2500Q, FL, etc.

2. Terminal Layout



3. Pin Description

Pin No.	Symbol	I/O	Description
1	V_{DD}	—	Power Supply.
2-5	KEY IN 0-KEY IN 3	I	KEY Matrix Input.
7-17	11G-1G	O	FL Grid Control Output.
18	$-V_{disp}$	I	FL Power Supply.
19-27	SEG A-SEG I	O	FL Segment Control Output.
33	DFCTSW	O	Signal that goes "H" During Focus Searches.
34	LOCK	I	Lock Signal Input.
35	FOK	I	FOK Signal Input.
36	CLCK	O	Clock Signal for Serial Data Transfer to IC401, IC301.
37	XLAT	O	Latch Signal for Serial Data Transfer to IC401.
38	DATA	O	Serial Data Output to IC401.
39	MUTE	O	Mute Signal Output.
40	SQCK	O	Clock Output for Reading SQSO.
41	SQSO	I	80-bit Sub Q and 16-bit PCM Peak Level Data.
43	$\overline{\text{RESET}}$	I	Reset Signal Input.
44	SCOR	I	Turns "H" when Sub Code Sync S0 or S1 is detected.
45	SENS	I	Sense Signal Input.
48	RMIN	I	Remote Controller Signal Input.
49	$\overline{\text{TEST}}$	I	Test Mode Input.
50	XCX	O	Signal that goes "H" when the Tracking Loop is OFF.
52	CLOSE	O	"H" with tray close.
53	OPEN	O	"H" with tray open.
54	$\overline{\text{CLOSE SW}}$	I	"L" with tray close.
55	$\overline{\text{OPEN SW}}$	I	"L" with tray open.
56	L.ON	O	Laser Control Output.
57	DFL	O	D/F Latch Signal Output.
58	DCS IN	I	Compulink Signal Input.
59	DCS OUT	O	Compulink Signal Output.
60	X1	I	Timer/Subsystem Clock Crystal Oscillator Connection Pins.
61	X2	O	
63	OSC2	O	Clock Oscillation Output.
64	OSC1	I	Clock Oscillation Input.

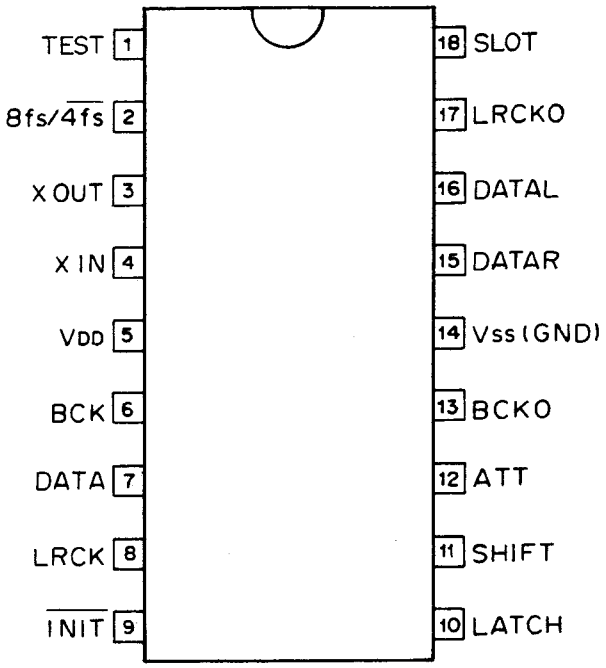
■ CXD2554P (IC301) · · · · DIGITAL FILTER

1. Outline

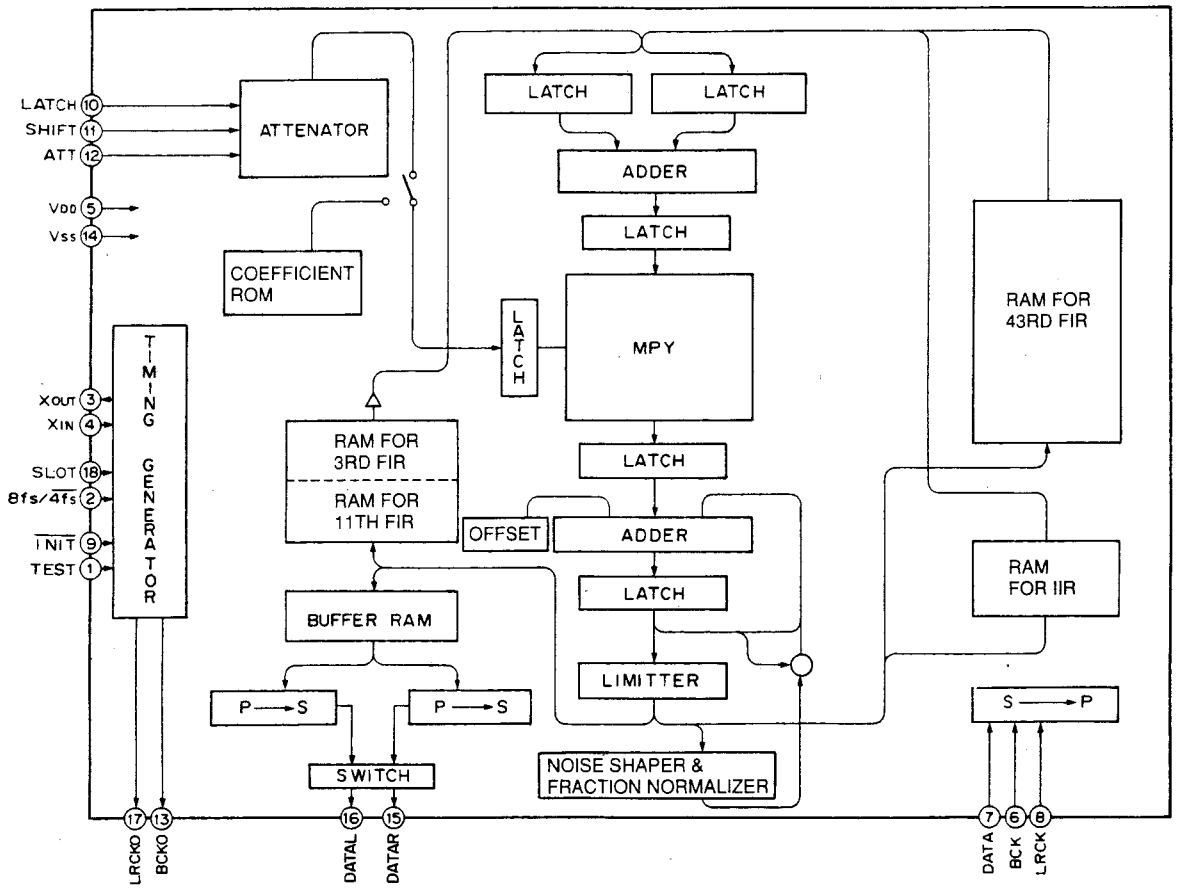
The CXD2554P is a 4- and 8-times oversampling digital filter LSI for a compact disc player. It has the following functions.

- 4- and 8-times digital filter
- De-emphasis function
- Attenuating function (Built-in 1st noise shaper)
- Digital offset function
- I/O format
  Input: 2's complement MSB first (serial)
  Output: 2's complement MSB first (serial)
  (16- or 18-bit slot selectable)

2. Terminal Layout



3. Internal Block Diagram



4. Pin Description

Pin No.	Symbol	I/O	Description
1	TEST	I	Test pin. Fixed at 'L' level in normal operation mode.
2	8fs /4fs	I	To specify FIR 3. 'H': 8fs 'L': 4fs
3	XOUT	O	Master clock output (f = 384fs)
4	XIN	I	Master clock input (f = 384fs)
5	V_{DD}	–	Power supply (+5 V)
6	BCK	I	BCK input
7	DATA	I	Serial data input (2's complement)
8	LRCK	I	LRCK input
9	$\overline{INIT}$	I	Re-synchronized by rising edge of this signal
10	LATCH	I	Latch clock input
11	SHIFT	I	Shift clock input
12	ATT	I	Attenuate data input
13	BCKO	O	BCK output
14	V_{SS} (GND)	–	Power supply (0 v)
15	DATAR	O	4fs mode: WCK output 8fs mode: RCH serial data output (2's complement)
16	DATAL	O	4fs mode: LCH and RCH time division serial data output (2's complement) 8fs mode: LCH serial data output (2's complement)
17	LRCKO	O	LRCK output
18	SLOT	I	To specify output slot. 'H': 18-bit slot 'L': 16-bit slot
–	(NC)	–	No connection

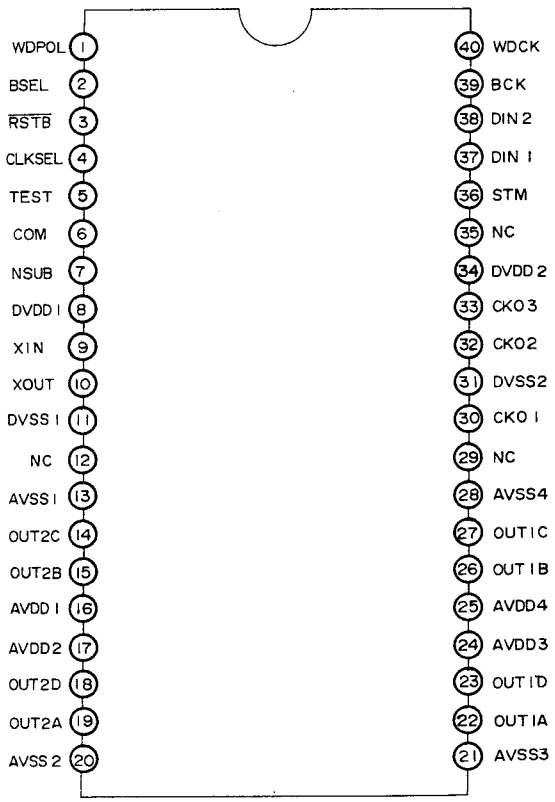
* TEST, 8fs /4fs and SLOT pins: Pull down resistance

■ JCE4501 (IC302) · · · · D/A CONVERTER

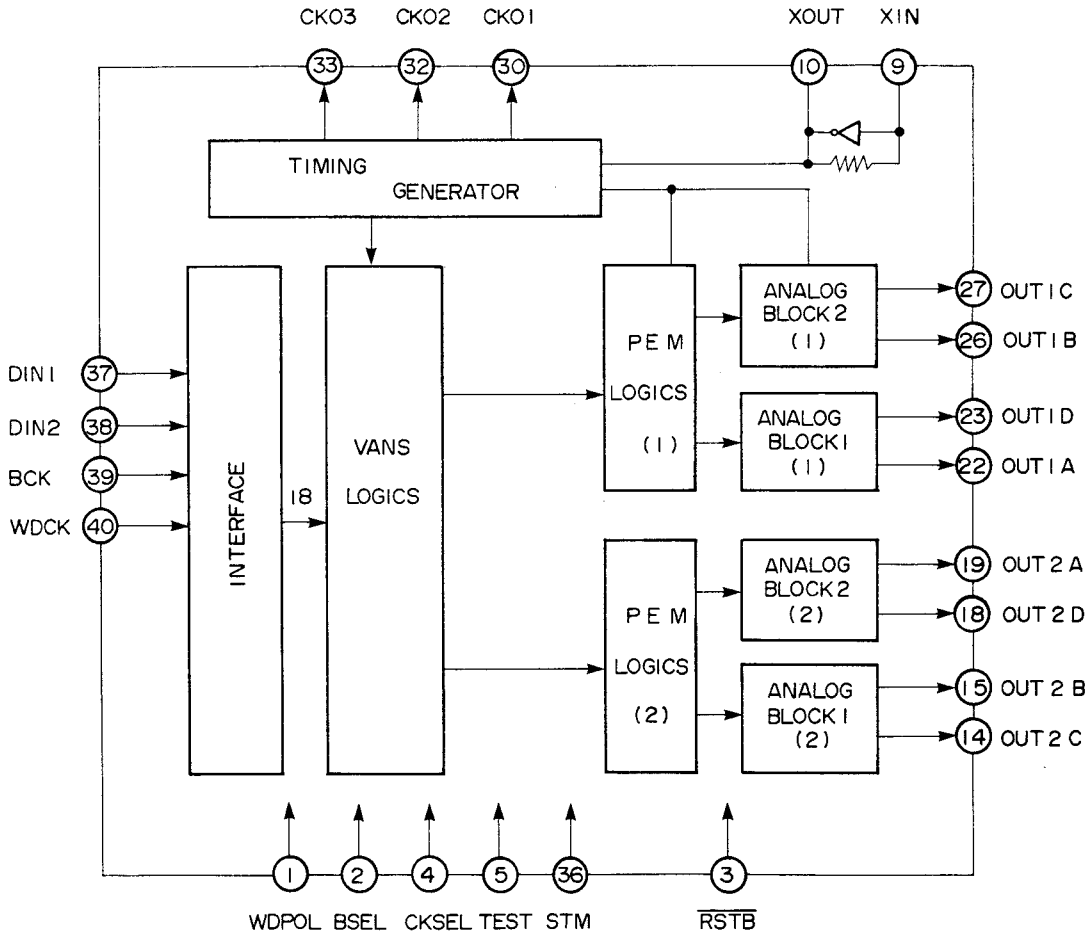
1. Outline

The JCE4501 is a CMOS digital-analog converter with independent left and right channels. It was developed for PCM digital audio equipment. It features pulse edge modulation (PEM) and Victor advanced noise shaping (VANS) for resolution equivalent to 20 bits (0-20 kHz) and a low distortion ratio. At JVC, this type of digital-analog converter is called a DD converter.

2. Terminal Layout



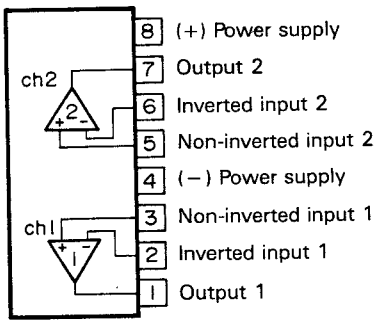
3. Internal Block Diagram



4. Pin Description

Pin No.	Symbol	I/O	Description
1	WDPOL	I	Word data polarity switching pin
2	BSEL	I	High: CXD2554P format, low: YM3414 format
3	$\overline{\text{RSTB}}$	I	Reset pin (low active)
4	CLKSEL	I	High: 256 Fs mode, low: 384 Fs mode
5	TEST	I	Test mode switching pin
6	COM	I	COM board voltage fastening pin (connected to D-VDD)
7	NSUB	I	Silicon board voltage fastening pin (connected to D-VDD)
8	DVDD1	—	Digital power supply pin 1
9	XIN	I	Crystal oscillator input pin
10	XOUT	O	Crystal oscillator output pin
11	DVSS1	—	Digital ground pin 1
12	NC	—	To ground
13	AVSS1	—	Analog gorund pin 1
14	OUT2C	O	2C PEM output pin
15	OUT2B	O	2B PEM output pin
16	AVDD1	—	Analog power supply pin 1
17	AVDD2	—	Analog power supply pin 2
18	OUT2D	O	2D PEM output pin
19	OUT2A	O	2A PEM output pin
20	AVSS2	—	Analog gorund pin 2
21	AVSS3	—	Analog ground pin 3
22	OUT1A	O	1A PEM output pin
23	OUT1D	O	1D PEM output pin
24	AVDD3	—	Analog power supply pin 3
25	AVDD4	—	Analog power supply pin 4
26	OUT1B	O	1B PEM output pin
27	OUT1C	O	1C PEM output pin
28	AVSS4	—	Analog ground pin 4
29	NC	—	To ground
30	CK01	O	Clock output pin 1 (384 Fs output)
31	DVSS2	—	Digital ground pin 2
32	CK02	O	Clock output pin 2 (192 Fs output)
33	CK03	O	Clock output pin 3 (128 Fs output)
34	DVDD2	—	Digital power supply pin 2
35	NC	—	Not connected
36	STM	I	Stereo/$\overline{\text{monaural}}$ switching pin (high: stereo output, low: left channel, reversed polarity left channel)
37	DIN1	I	Left channel 18-bits 8Fs serial data input pin
38	DIN2	I	Right channel 18-bits 8Fs serial data input pin
39	BCK	I	Bit clock input pin
40	WDCK	I	Word clock input pin

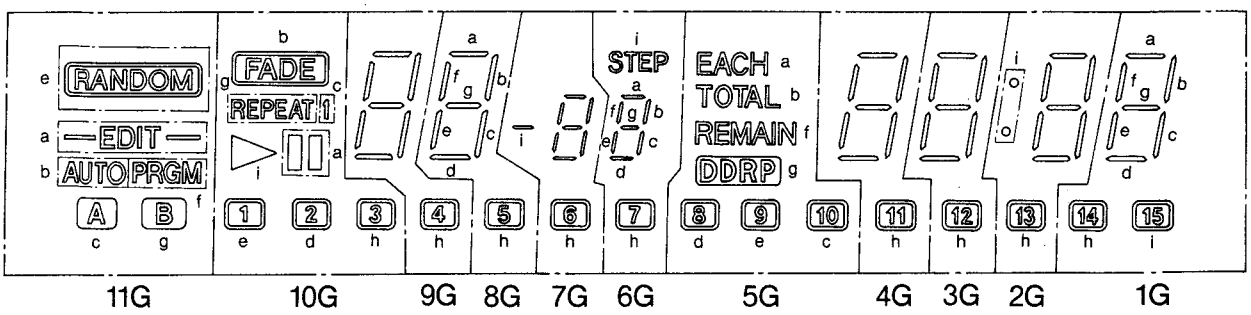
■ M5218AL (IC303 ~ IC305) .... DUAL OP AMP



FL Display Tube Connection

■ FL201: ELU 0001-114

1. Grid Layout



2. Pin Connection

TERMINAL NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
ELECTRODE	F1	F1	NP	NC	11G	10G	9G	8G	7G	6G	5G	P (i)	4G	3G	2G	1G	P (a)	P (b)	P (f)	
TERMINAL NO.		20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
ELECTRODE		P (g)	P (c)	P (e)	P (d)	P (h)	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NP	F2	F2

Notes F: Filament NP: No Pin
G: Grid NC: No Connection
P: Anode

Disassembly Procedures

(1) Top cover removal

1. Remove the two screws holding the top cover on the left and right and the two screws at the rear top.
2. Gently spread both sides of the top cover to the outside, lift up the rear section, and remove the top cover.

(2) Tray removal

1. Remove the top cover.
2. Switch on the power. Press the OPEN/CLOSE switch to bring the tray forward and with the tray forward, switch off the power.
3. Push the tray part way and remove the three screws holding the tray stopper.
4. Pull the tray toward the front to remove it.

Note: If the power does not come on due to breakdown or the like, insert a plastic screwdriver through the hole at the bottom of the front panel and turn it clockwise to bring the tray forward.

(3) Mechanism asembly removal

1. Remove the tray.
2. Remove the two screws holding the clamper assembly, then remove the clamper assembly.
3. Remove the three screws holding the mechanism assembly.

(4) Main PC board (ENN-258-1) removal

1. Remove the top cover.
2. Remove the six screws holding the board (including the two for holding the transfomer) and remove the three screws on the rear panel.
3. Remove the Connectors Connecting with Main PC Board.

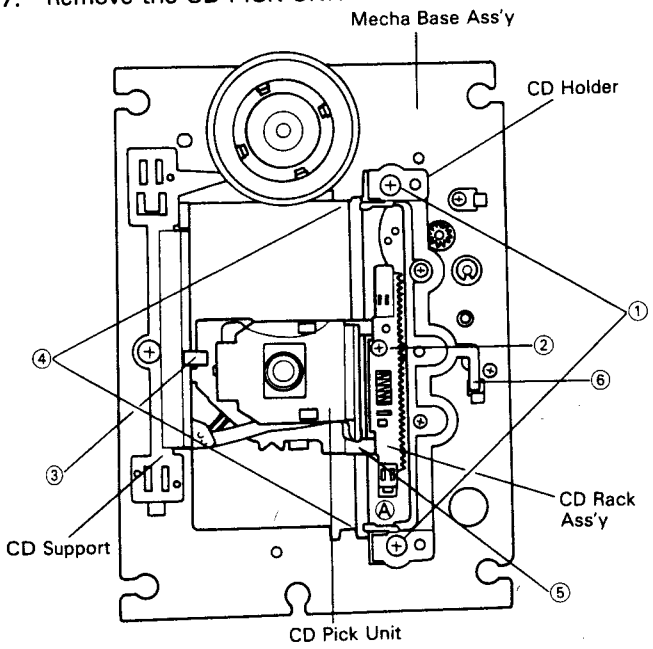
(5) Front panel assembly removal

1. Remove the top cover.
2. Remove the screw at the center bottom of the front panel.
3. Remove the screw holding the power switch installation bracket.
4. Remove the two hooks at each end of the bottom of the front panel and lift the bottom up.

2. Fasten the Spindle and Feed Motor P.C. board with the screw and solder.

(6) Laser pickup removal

1. Remove the top cover, tray assembly, cover and the clamp.
2. Move the Pickup Unit from rest position to the center pushing ⑤ point with finger.
3. Remove the screw ② from the CD RACK Ass'y.
4. Remove the CD RACK Ass'y.
5. Remove the screw ①from the mecha base Ass'y.
6. Remove the CD HOLDER fastening the shaft from the mechabase Ass'y. (Release the hook ⑥)
7. Remove the CD PICK UNIT with the shaft.

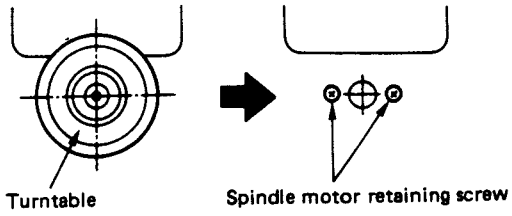


(7) Laser pickup installation

1. Connect two wires with the connectors of APC P.C. Board.
2. While installing the ③ in the CD SUPPORT, set the shaft on the base hook ④.
3. Install the CD HOLDER.
4. Install the CD RACK Ass'y in CD PICK UNIT.
   1) Fit end Ⓐ
   2) Fix screw ②.

(8) Removing the spindle motor

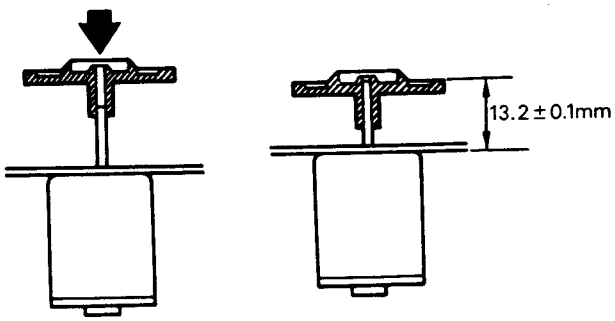
1. Remove the Mechanism Ass'y.
2. Remove the Clump Ass'y.
3. Remove the turntable, and remove the two screws retaining the spindle motor.



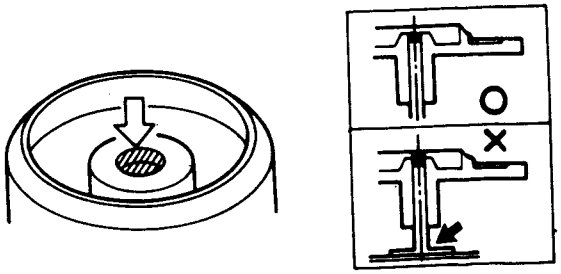
4. Remove the screw retaining the Spindle and Feed Motor P.C. Board and unsolder it.

(9) Spindle motor installation

1. Tighten the 2 screws to the same torque.
2. Fasten the Spindle and Feed Motor P.C. board with the screw and solder.
3. Install the turntable. When installing, press straight down at the center of the turntable until the distance from the bottom of the mechanism base to the top of the turntable is exactly 13.2 ± 0.1mm.



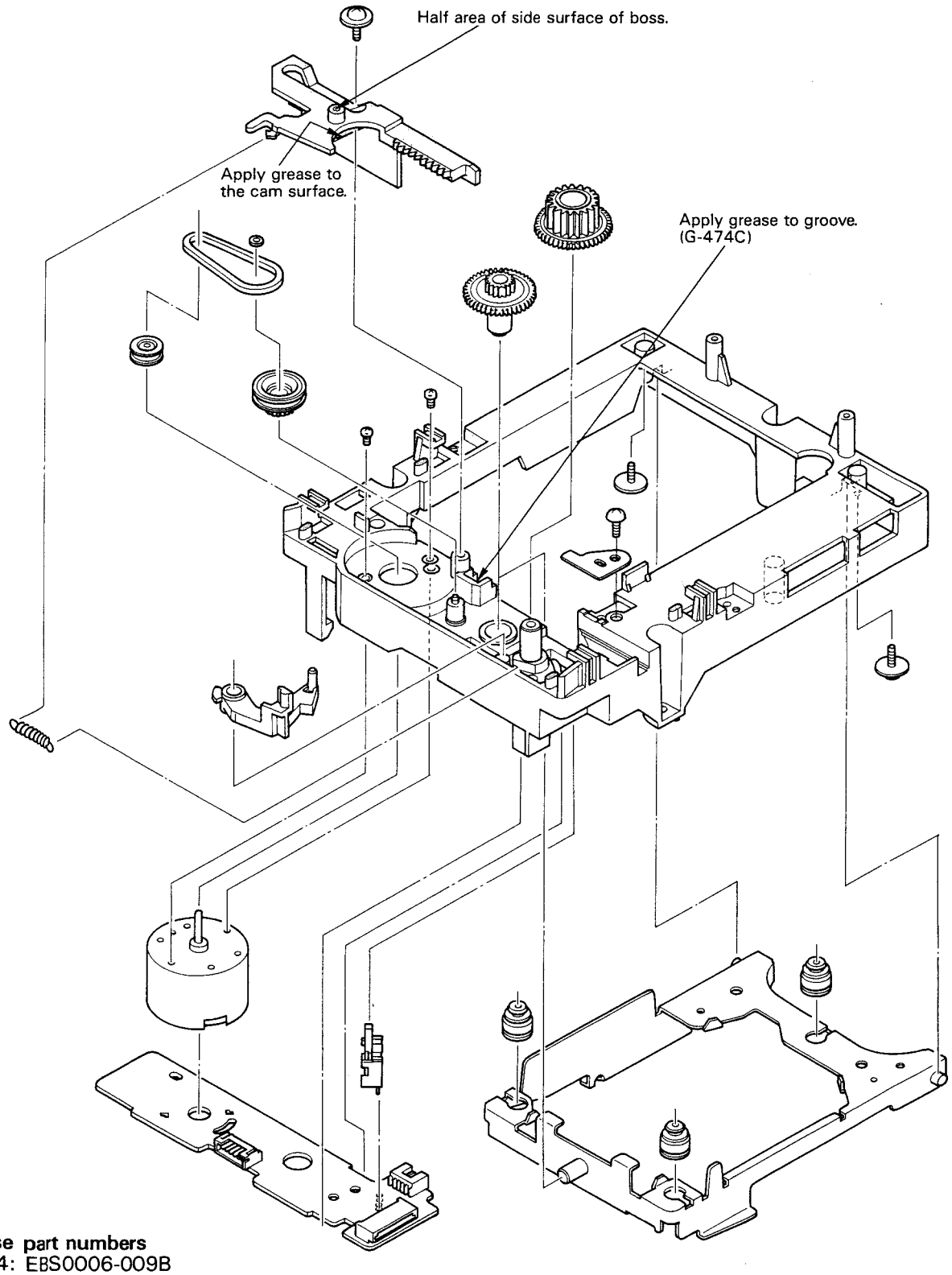
3. After insertion is complete, bond the motor shaft and turntable together (at the section marked by an arrow in the figure on the left below).



Use "LOCKTITE" #460 bonding agent, and apply as little as possible. Take care not to allow any excess bonding agent to get onto the turntable. Be extremely careful not to allow bonding agent to adhere to the motor bearings (the section marked by an arrow in the figure on the right).

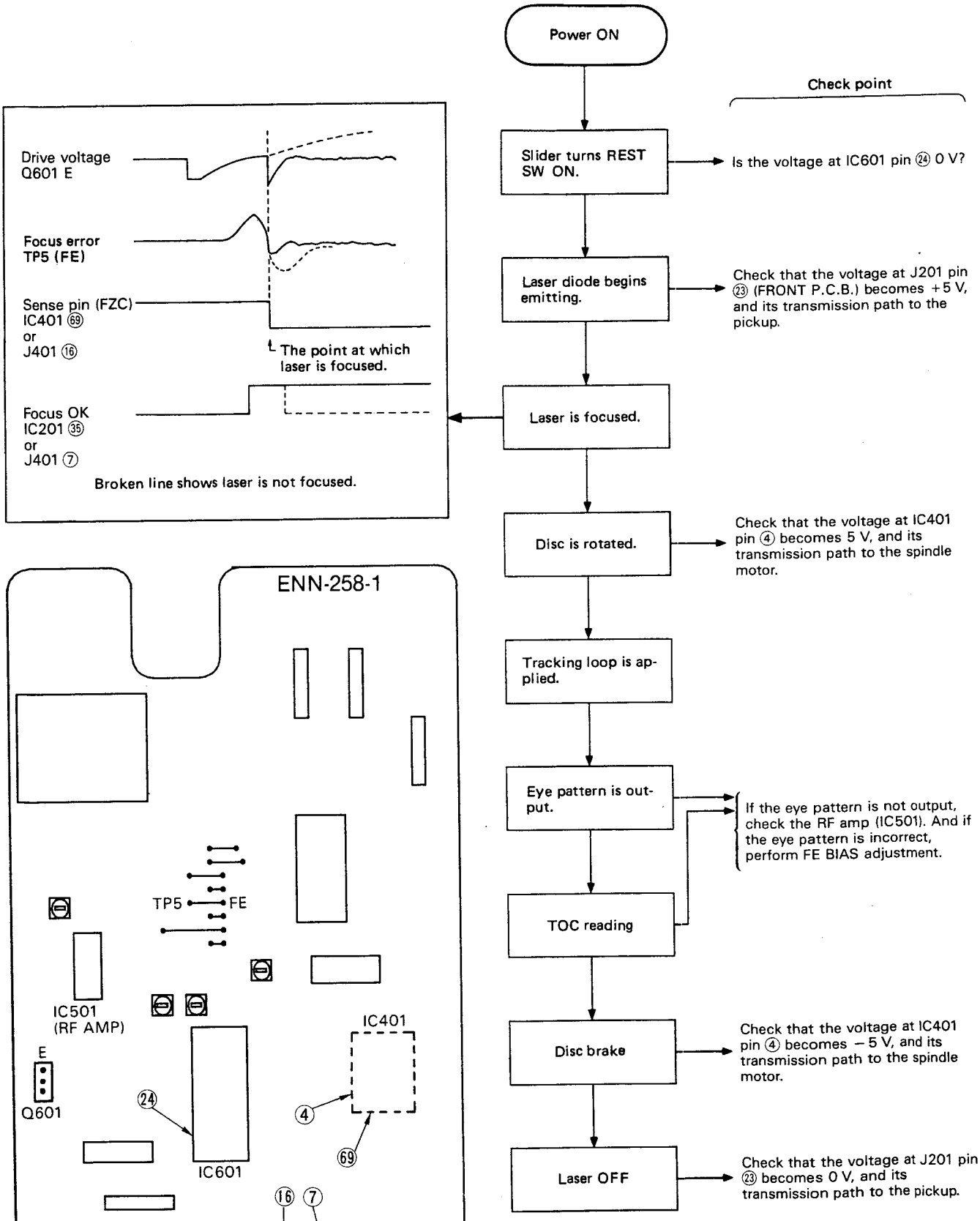
Application Points for Grease

Grease used
G-334 (Shin-Etsu Chemical Co., Ltd.)
G-474C (Kanto Chemical Co., Ltd.)



Grease part numbers
G-334: EBS0006-009B
G-474C: EBS0006-019B

Flow of Operation Until TOC is Read

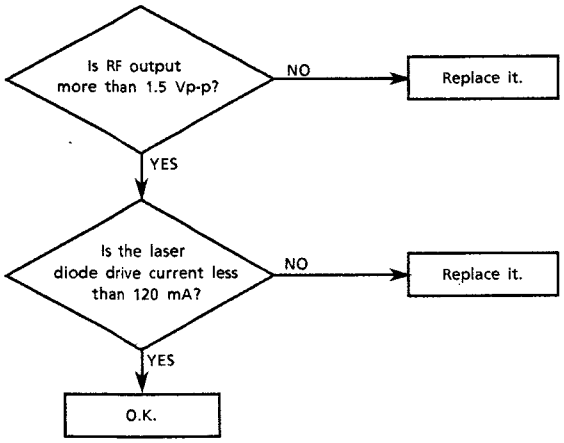

Power ON
Check point
Slider turns REST SW ON.
Is the voltage at IC601 pin ㉔ 0 V?
Laser diode begins emitting.
Check that the voltage at J201 pin ㉓ (FRONT P.C.B.) becomes +5 V, and its transmission path to the pickup.
Laser is focused.
Disc is rotated.
Check that the voltage at IC401 pin ④ becomes 5 V, and its transmission path to the spindle motor.
Tracking loop is applied.
Eye pattern is output.
If the eye pattern is not output, check the RF amp (IC501). And if the eye pattern is incorrect, perform FE BIAS adjustment.
TOC reading
Disc brake
Check that the voltage at IC401 pin ④ becomes −5 V, and its transmission path to the spindle motor.
Laser OFF
Check that the voltage at J201 pin ㉓ becomes 0 V, and its transmission path to the pickup.

Maintenance of Laser Pickup

(1) Life of the laser diode

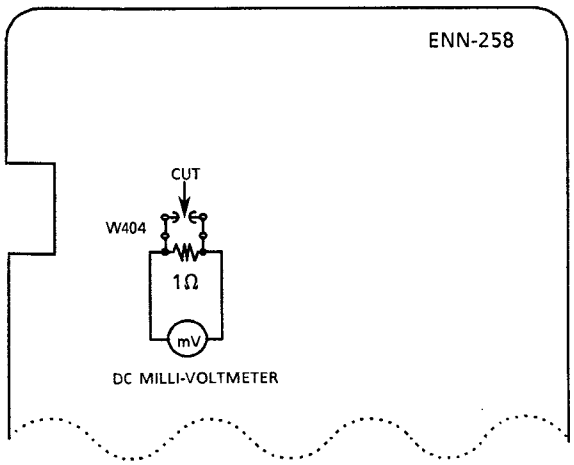
When the life of the laser diode has expired, the following symptoms will appear.

1. The level of RF output (EFM output: amplitude of eye pattern) will be low.
2. The drive current required by the laser diode will be increased.
   In such a case, check the life of the laser diode following the flowchart below



(2) Measurement of laser diode drive current

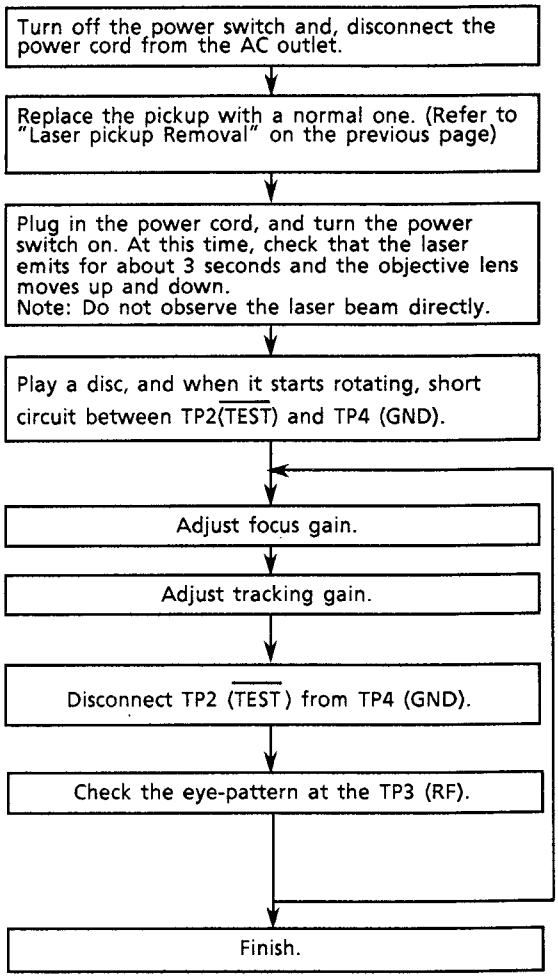
Replace the jump wire (W404) shown below with the resistor (1Ω).
Measure the voltage across the resistor with a milli-voltmeter. If the voltage is more than 120mV, the life of the laser diode has expired



(3) Semi-fixed resistor on the APC PC board

The semi-fixed resistor on the APC printed circuit board which is attached to the pickup is used to adjust the laser power. Since this adjustment should be performed to match the characteristics of the whole optical block, do not touch the semi-fixed resistor.
If the laser power is lower than the specified value, the laser diode is almost worn out, and the laser pickup should be replaced.
If the semi-fixed resistor is adjusted while the pickup is functioning normally, the laser pickup may be damaged due to excessive current.

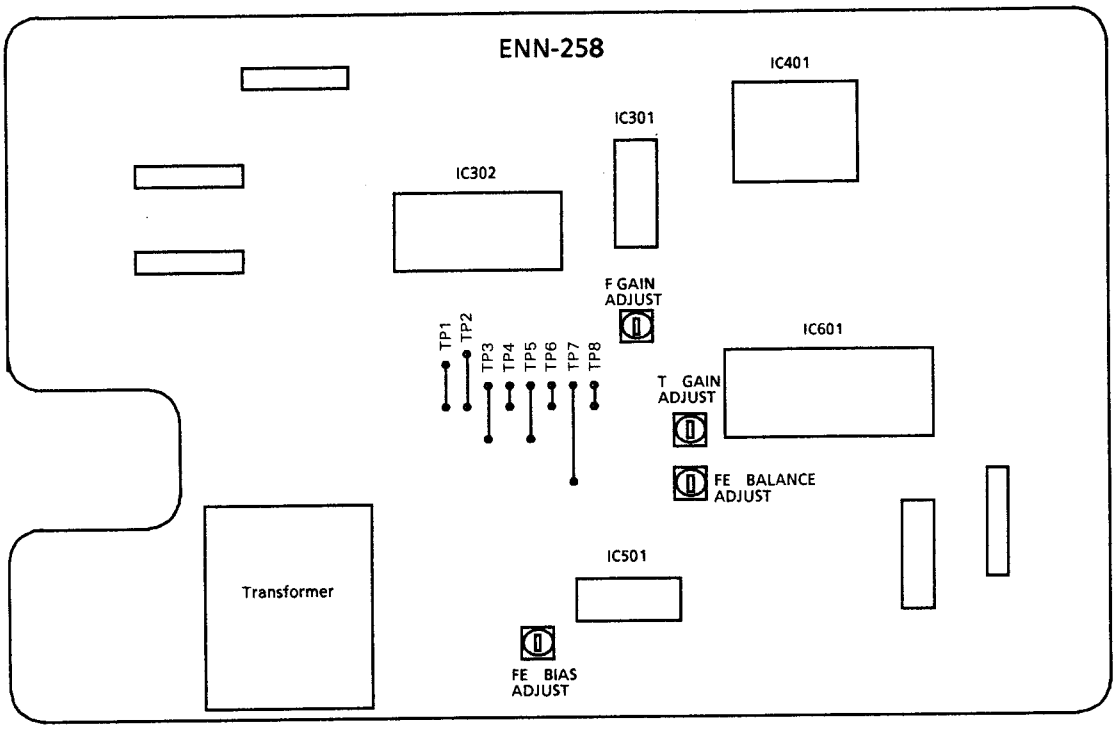
Replacement of Laser Pickup


Turn off the power switch and, disconnect the power cord from the AC outlet.
Replace the pickup with a normal one. (Refer to "Laser pickup Removal" on the previous page)
Plug in the power cord, and turn the power switch on. At this time, check that the laser emits for about 3 seconds and the objective lens moves up and down.
Note: Do not observe the laser beam directly.
Play a disc, and when it starts rotating, short circuit between TP2(TEST) and TP4 (GND).
Adjust focus gain.
Adjust tracking gain.
Disconnect TP2 (TEST) from TP4 (GND).
Check the eye-pattern at the TP3 (RF).
Finish.

Note: Since one adjustment may affect other settings, repeat these adjustments a few times.

Adjustment Procedures

Main P.C.B (ENN-260-1) Adjustment



■ Adjustment instruments

Oscilloscope , Test disc (CRG-1117)

■ Adjustment Procedures

1) FE bias check

1. Connect an oscilloscope to TP.5(FE) and TP.4(GND).
2. Adjust R512(FE bias) so that the DC voltage at TP.5 becomes 0 ± 10mV.

2) EF balance adjustment

1. Load a test disc and press the PLAY button.
2. Short-circuit between TP.2(TEST) and TP.4(GND).
3. Adjust R513(EF balance) so that the center of the waveform at TP.7(TE) become 0V.

3) Gain adjustment

A 2-needle VTVM and special oscillator are required in order to perform this adjustment exactly. However, these values have a margin , so even if it is slightly out, there is no problem. Therefore it is not usually to perform this adjustment after replacing the pickup.

If the gain is out of adjustment , the symptoms below will appear.

- **Gain too low**
  Focus gain : Focus is not obtained and disc does not rotate.
  Tracking gain : Mechanical shock occurs easily and sound is interrupted. Or time counter display stop counting.
- **Gain too high**
  Focus gain : Scratches (on the disc) easily interrupt play , and noise is increased during play .
  Tracking gain : Since the follow-up ability of the pickup is too high , the pickup may oscillate and oscillating sound may output.

As described above , the focus and tracking gain adjustment are performed so as to satisfy mutually contradictory characteristics .
A simplified adjustment procedure is described below . However , since exact adjustment cannot be performed prior to adjustments , note (or mark) the positions of the semi-fixed VRs .
If the positions after the simplified adjustment are only slightly different , return the VRs to their original positions .

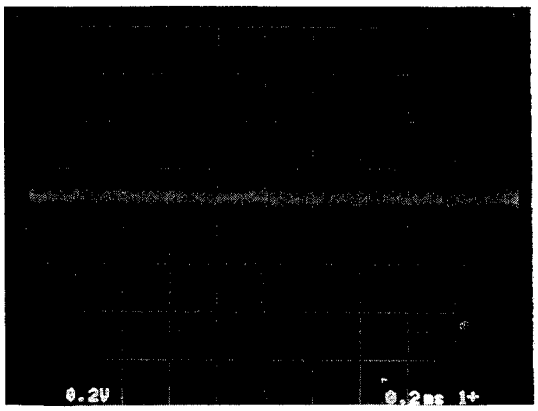
1. Focus gain adjustment

1) Connect an oscilloscope to TP.5(FE) and TP.4(GND).
2) Load a test disc and press the PLAY button.
3) Adjust R603 (F.gain ADJ) so that the correct waveform as shown in figure 1 is obtain.

2. Tracking gain adjustment

1) Connect an oscilloscope to TP.7(TE) and TP.4(GND).
2) Load a test disc and press the PLAY button.
3) Adjust R604 (T.gain ADJ) so that the correct waveform as shown in figure 2 is obtain

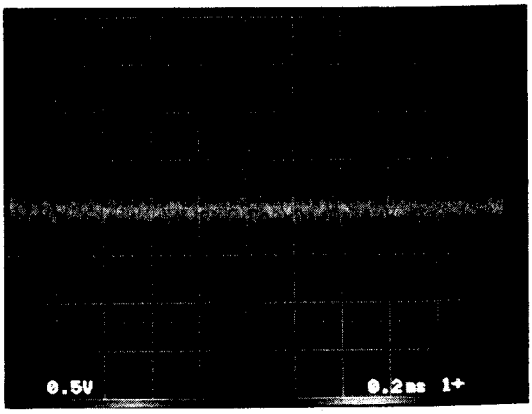
Focus Gain Adjustment



200 mv/div. 0.2 ms/div.

Fig. 1

Tracking Gain Adjustment

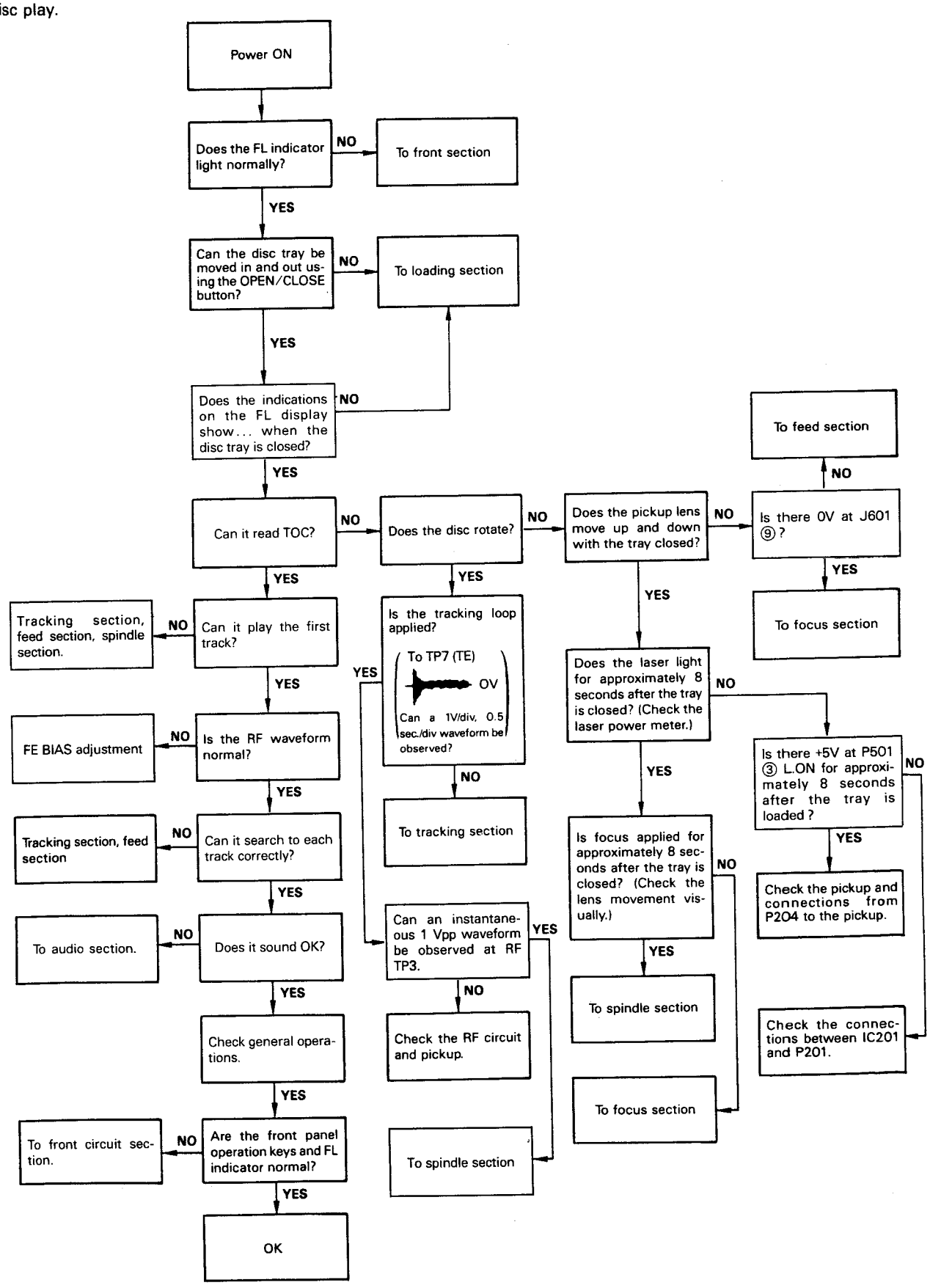


500 mv/div. 0.2 ms/div.

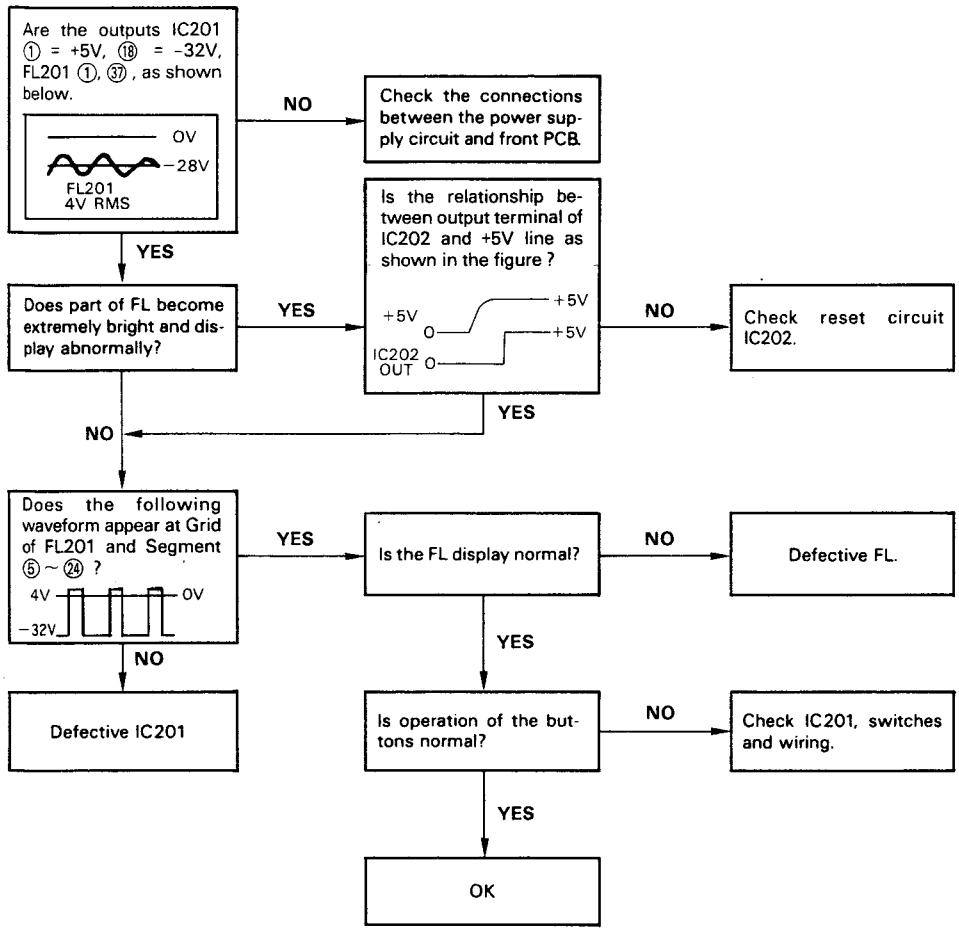
Fig. 2

Troubleshooting

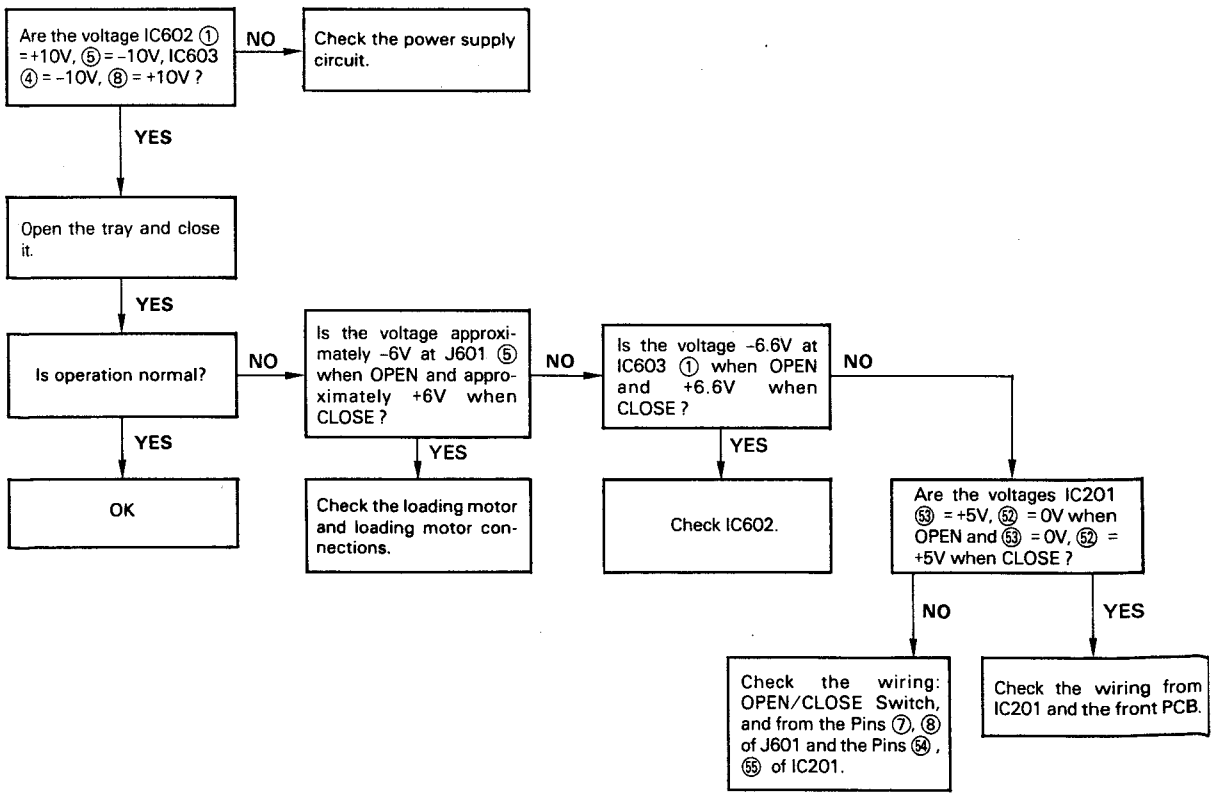
The following shows the status of the various circuits from turning on the power to the start of disc play.



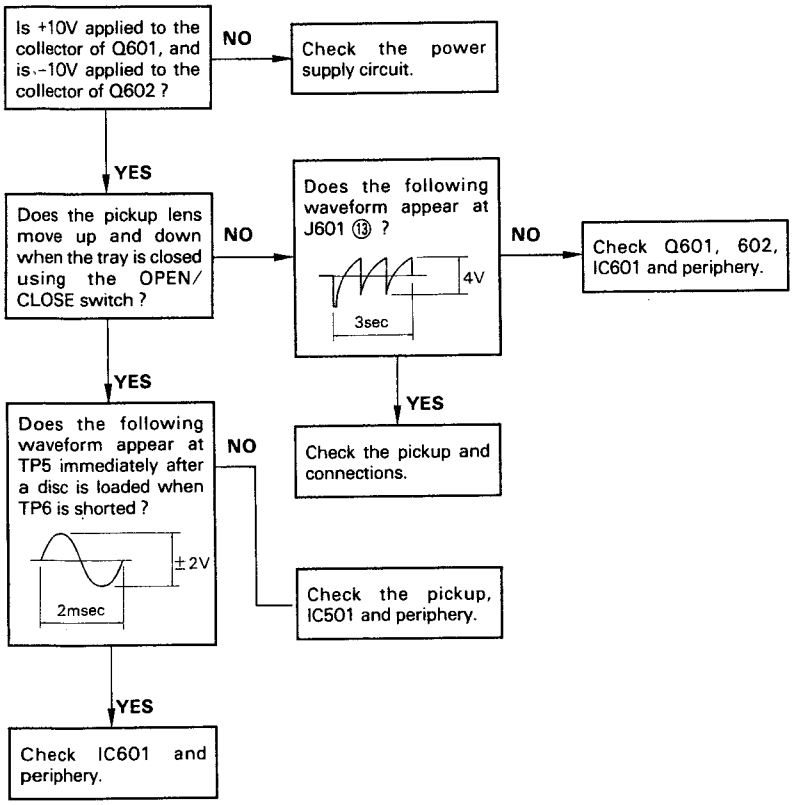
Front Circuit Section



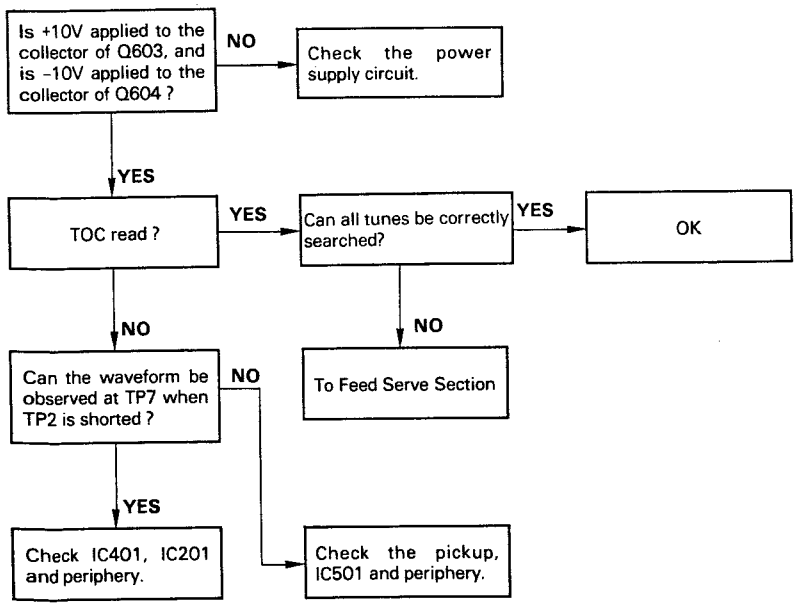
Loading Section


Are the voltage IC602 ① =+10V, ⑤=-10V, IC603 ④=-10V, ⑧=+10V ?
NO
Check the power supply circuit.
YES
Open the tray and close it.
YES
Is operation normal?
NO
Is the voltage approximately -6V at J601 ⑤ when OPEN and approximately +6V when CLOSE ?
NO
Is the voltage -6.6V at IC603 ① when OPEN and +6.6V when CLOSE ?
NO
YES
OK
YES
Check the loading motor and loading motor connections.
YES
Check IC602.
Are the voltages IC201 ㊸ =+5V, ㊷ =0V when OPEN and ㊸ =0V, ㊷ =+5V when CLOSE ?
NO
YES
Check the wiring: OPEN/CLOSE Switch, and from the Pins ⑦, ⑧ of J601 and the Pins ㊹, ㊺ of IC201.
Check the wiring from IC201 and the front PCB.

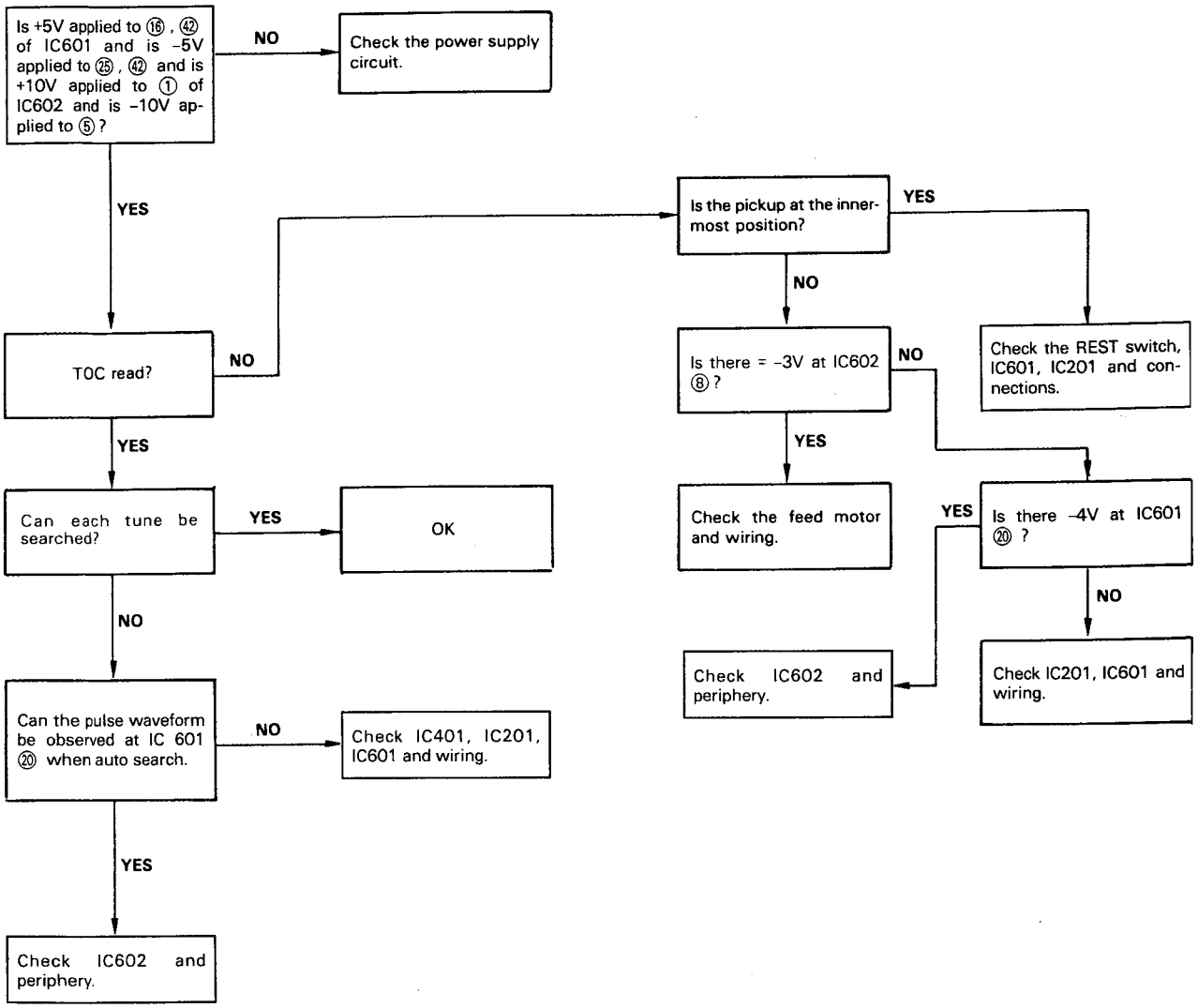
Focus Servo Section


Is +10V applied to the collector of Q601, and is -10V applied to the collector of Q602 ?
NO
Check the power supply circuit.
YES
Does the pickup lens move up and down when the tray is closed using the OPEN/CLOSE switch ?
NO
Does the following waveform appear at J601 ⑬ ?
4V
3sec
NO
Check Q601, 602, IC601 and periphery.
YES
Check the pickup and connections.
YES
Does the following waveform appear at TP5 immediately after a disc is loaded when TP6 is shorted ?
±2V
2msec
NO
Check the pickup, IC501 and periphery.
YES
Check IC601 and periphery.

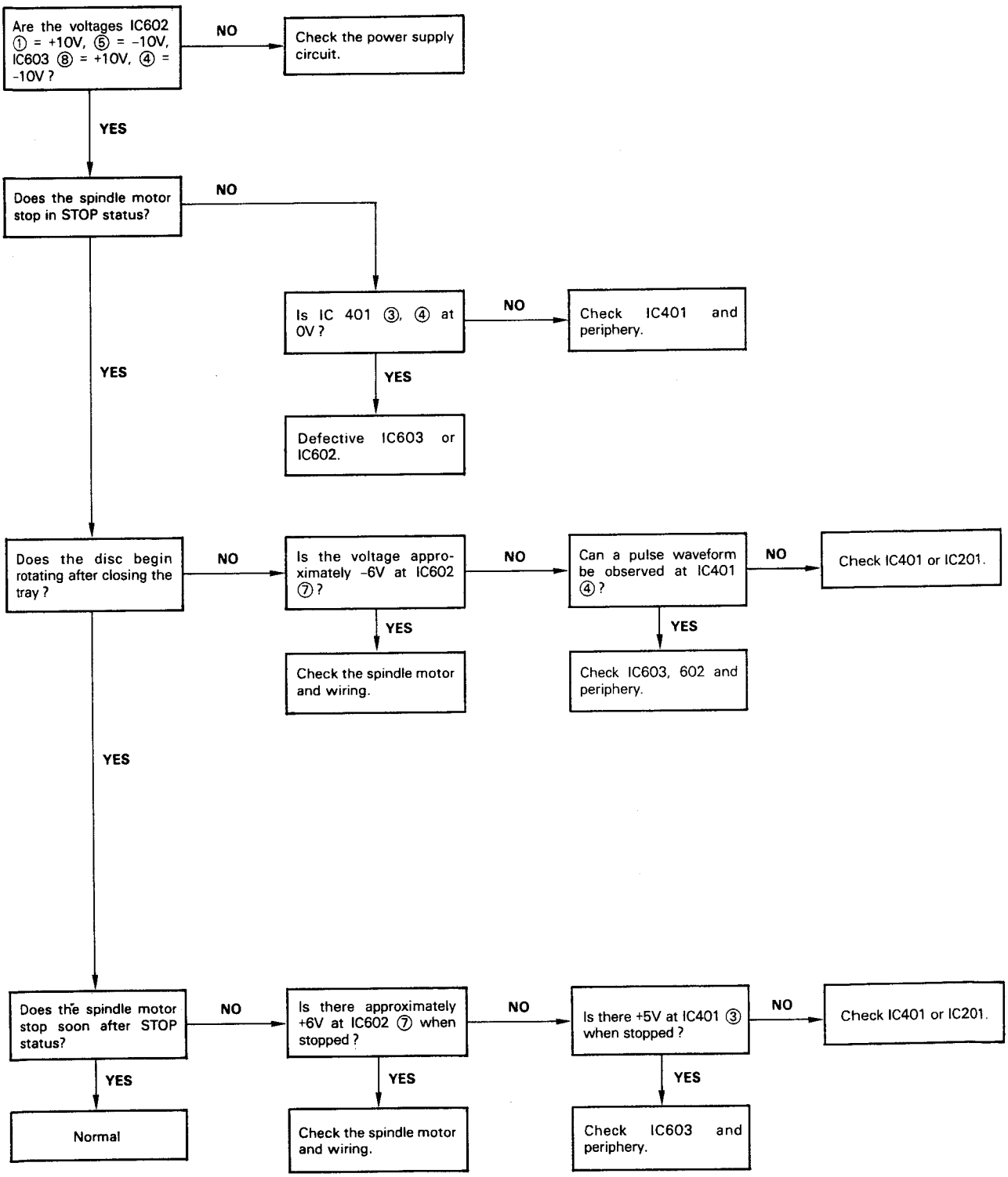
Tracking Servo Section


Is +10V applied to the collector of Q603, and is -10V applied to the collector of Q604 ?
NO
Check the power supply circuit.
YES
TOC read ?
YES
Can all tunes be correctly searched?
YES
OK
NO
To Feed Serve Section
NO
Can the waveform be observed at TP7 when TP2 is shorted ?
NO
YES
Check IC401, IC201 and periphery.
Check the pickup, IC501 and periphery.

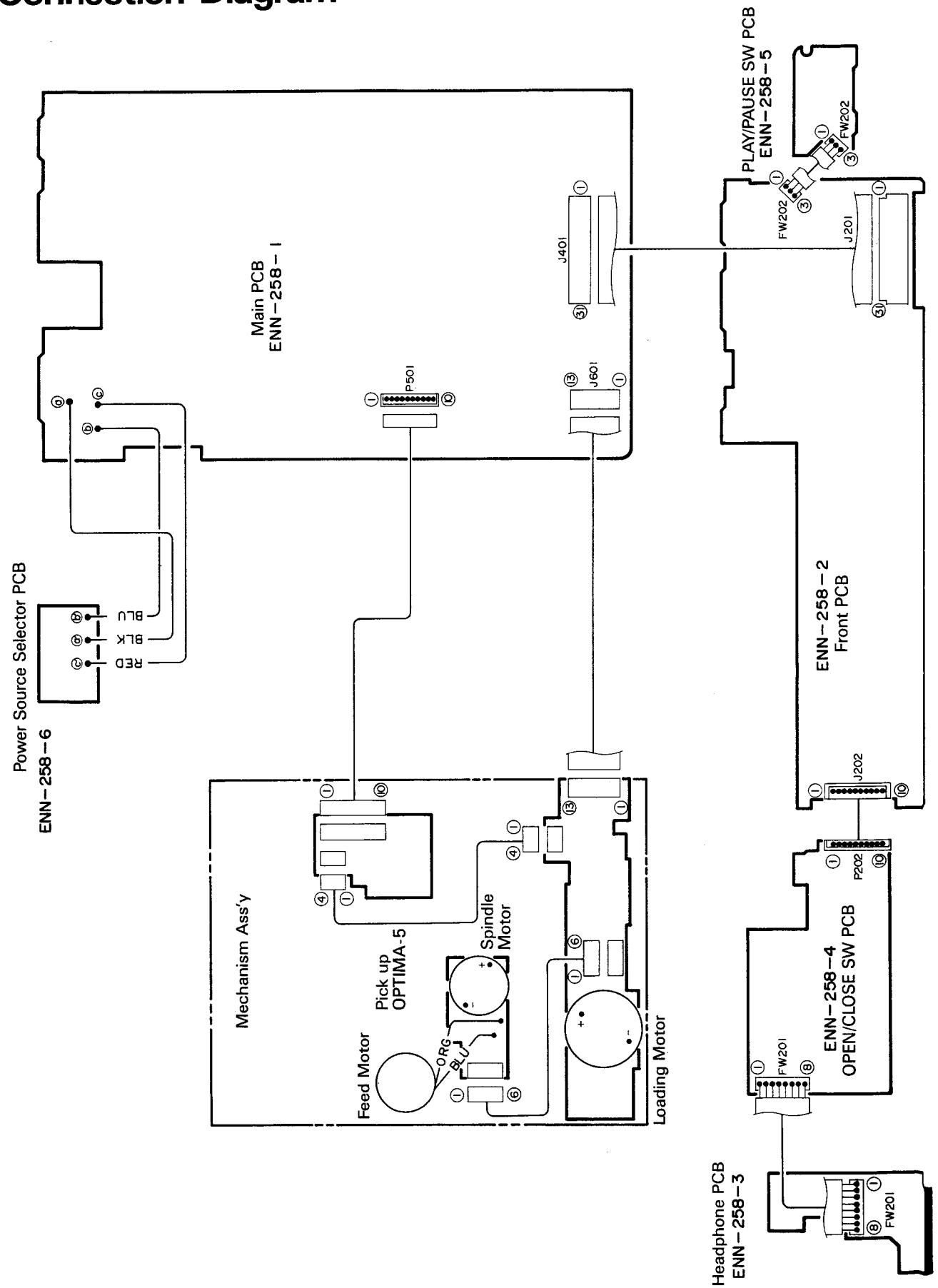
Feed Servo Section


Is +5V applied to ⑯, ㊷ of IC601 and is -5V applied to ㉕, ㊷ and is +10V applied to ① of IC602 and is -10V applied to ⑤?
NO
Check the power supply circuit.
YES
TOC read?
NO
YES
Can each tune be searched?
YES
OK
NO
Can the pulse waveform be observed at IC 601 ⑳ when auto search.
NO
Check IC401, IC201, IC601 and wiring.
YES
Check IC602 and periphery.
Is the pickup at the innermost position?
YES
NO
Is there = -3V at IC602 ⑧?
NO
Check the REST switch, IC601, IC201 and connections.
YES
Check the feed motor and wiring.
YES
Is there -4V at IC601 ⑳?
NO
Check IC602 and periphery.
Check IC201, IC601 and wiring.

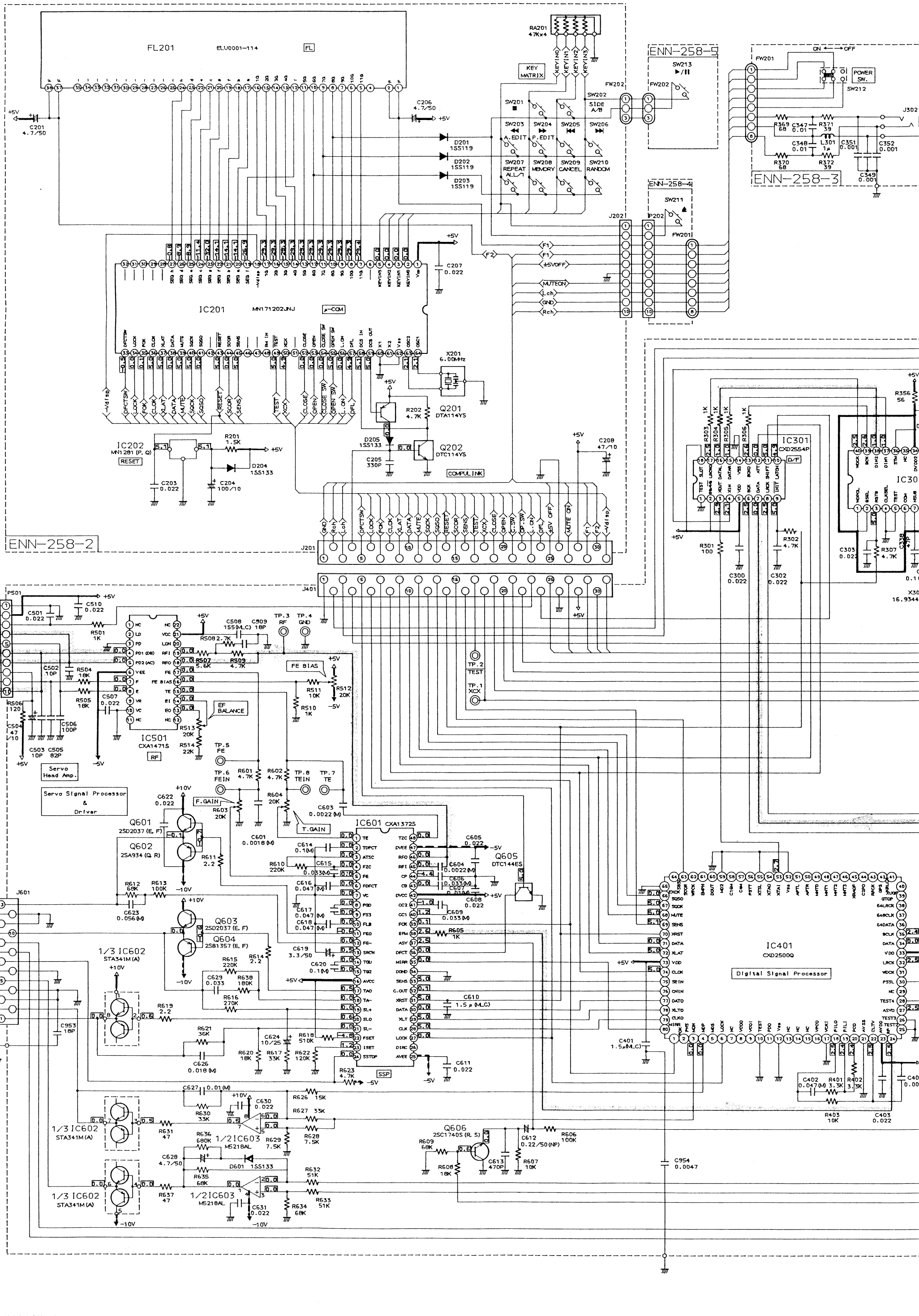
Spindle Servo Section

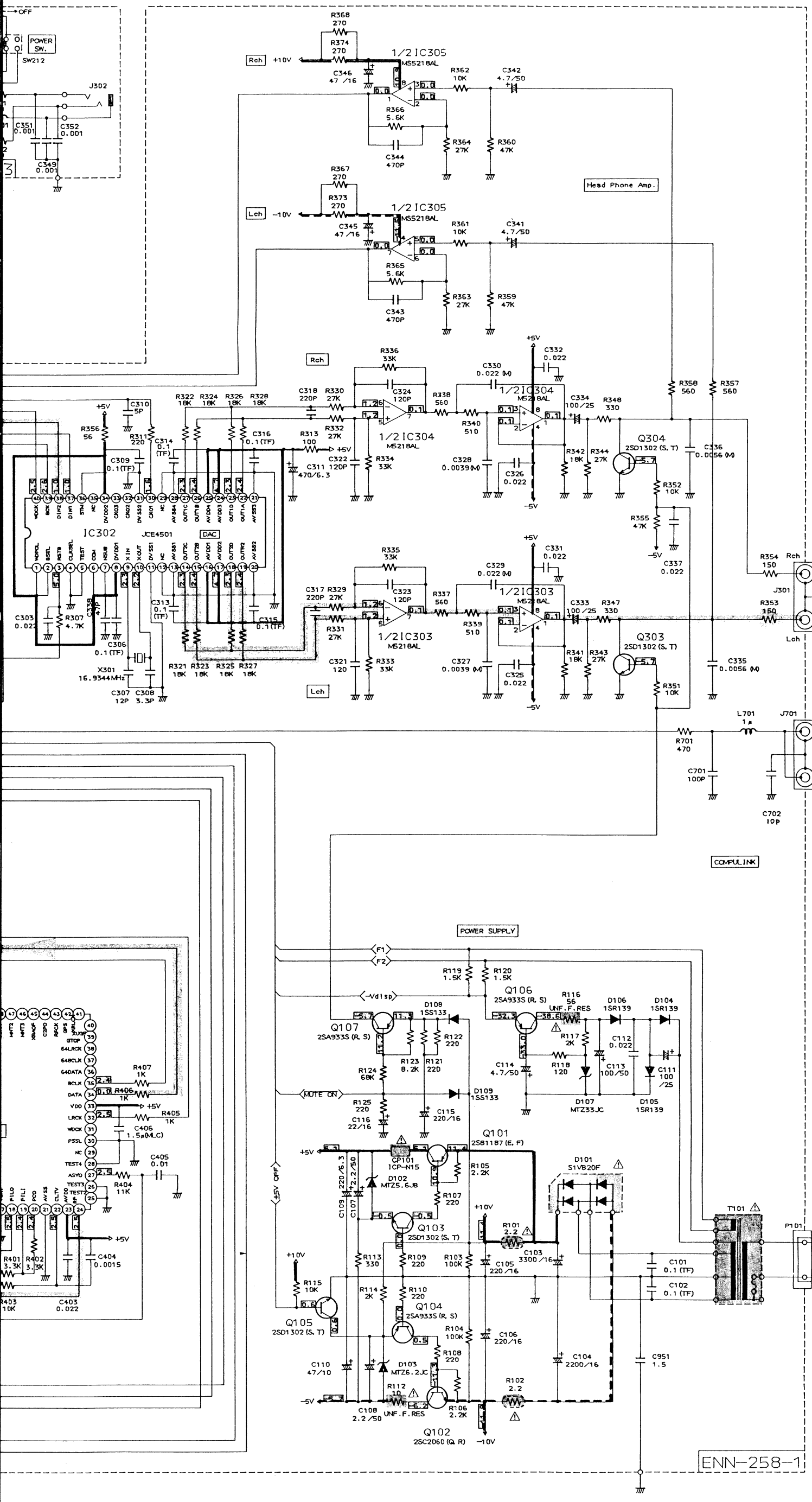

Are the voltages IC602 ① = +10V, ⑤ = -10V, IC603 ⑧ = +10V, ④ = -10V ?
NO
Check the power supply circuit.
YES
Does the spindle motor stop in STOP status?
NO
Is IC 401 ③, ④ at 0V ?
NO
Check IC401 and periphery.
YES
Defective IC603 or IC602.
YES
Does the disc begin rotating after closing the tray ?
NO
Is the voltage approximately -6V at IC602 ⑦ ?
NO
Can a pulse waveform be observed at IC401 ④ ?
NO
Check IC401 or IC201.
YES
Check the spindle motor and wiring.
YES
Check IC603, 602 and periphery.
YES
Does the spindle motor stop soon after STOP status?
NO
Is there approximately +6V at IC602 ⑦ when stopped ?
NO
Is there +5V at IC401 ③ when stopped ?
NO
Check IC401 or IC201.
YES
Normal
YES
Check the spindle motor and wiring.
YES
Check IC603 and periphery.

Connection Diagram



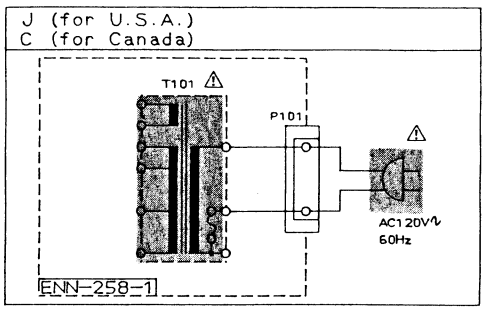
Schematic Diagram



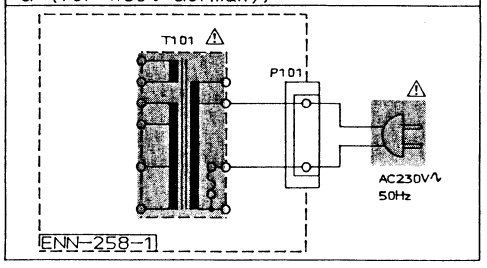


POWER SUPPLY SECTION

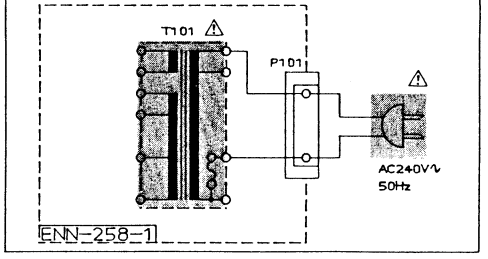
J (for U.S.A.)
C (for Canada)



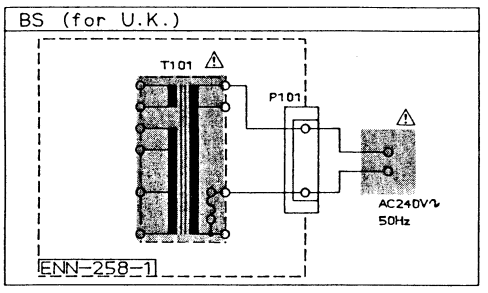
E (for Continental Europe)
G (for West Germany)



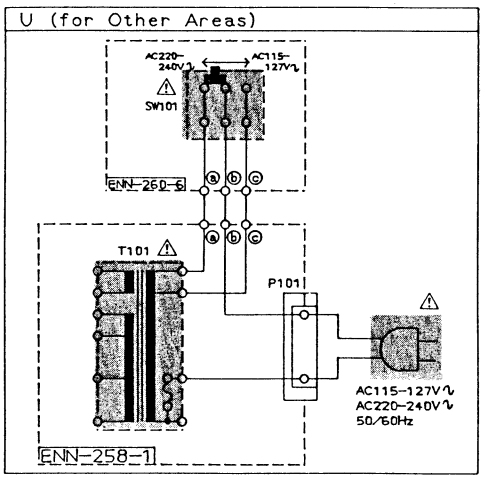
A (for Australia)



BS (for U.K.)



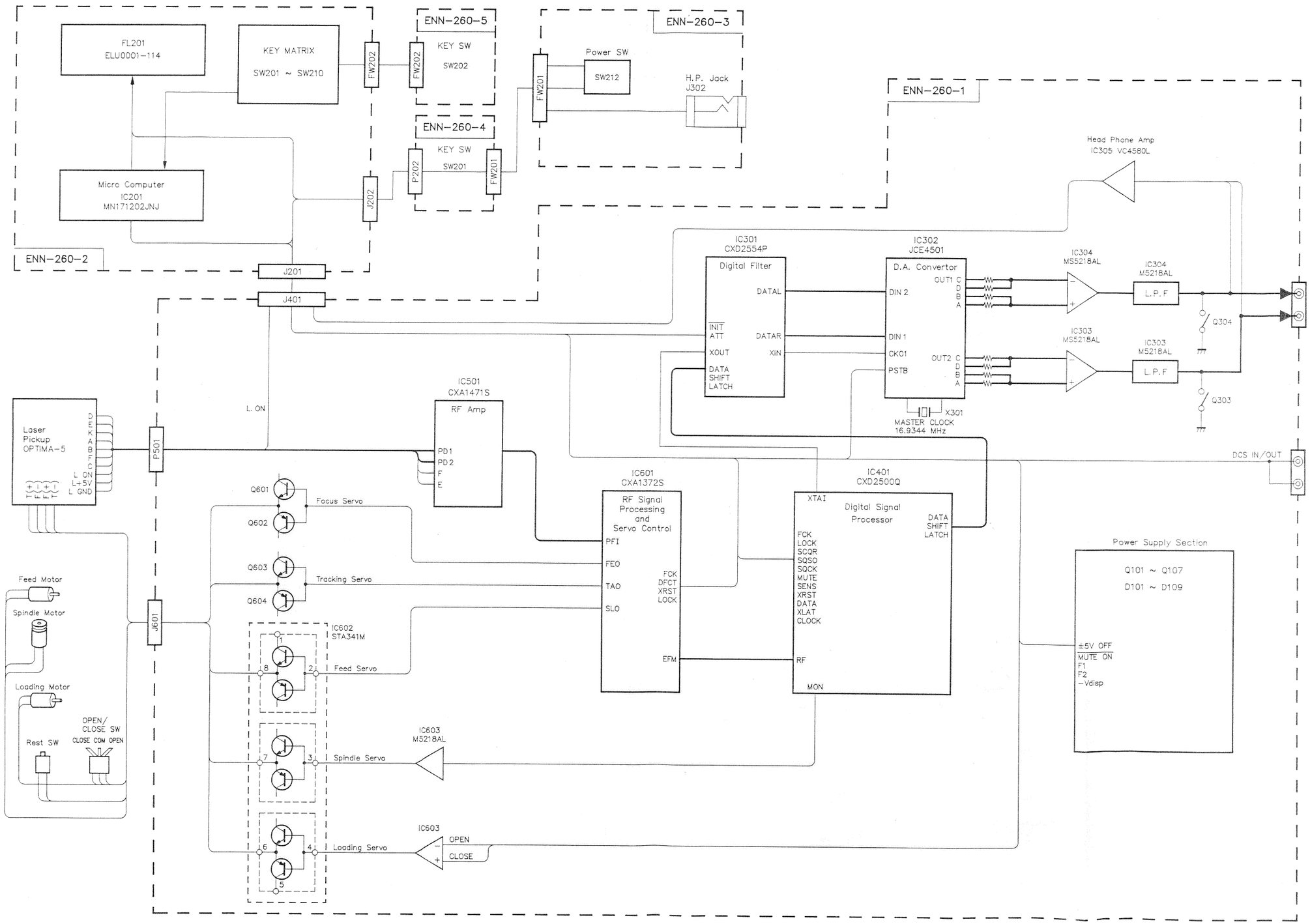
U (for Other Areas)



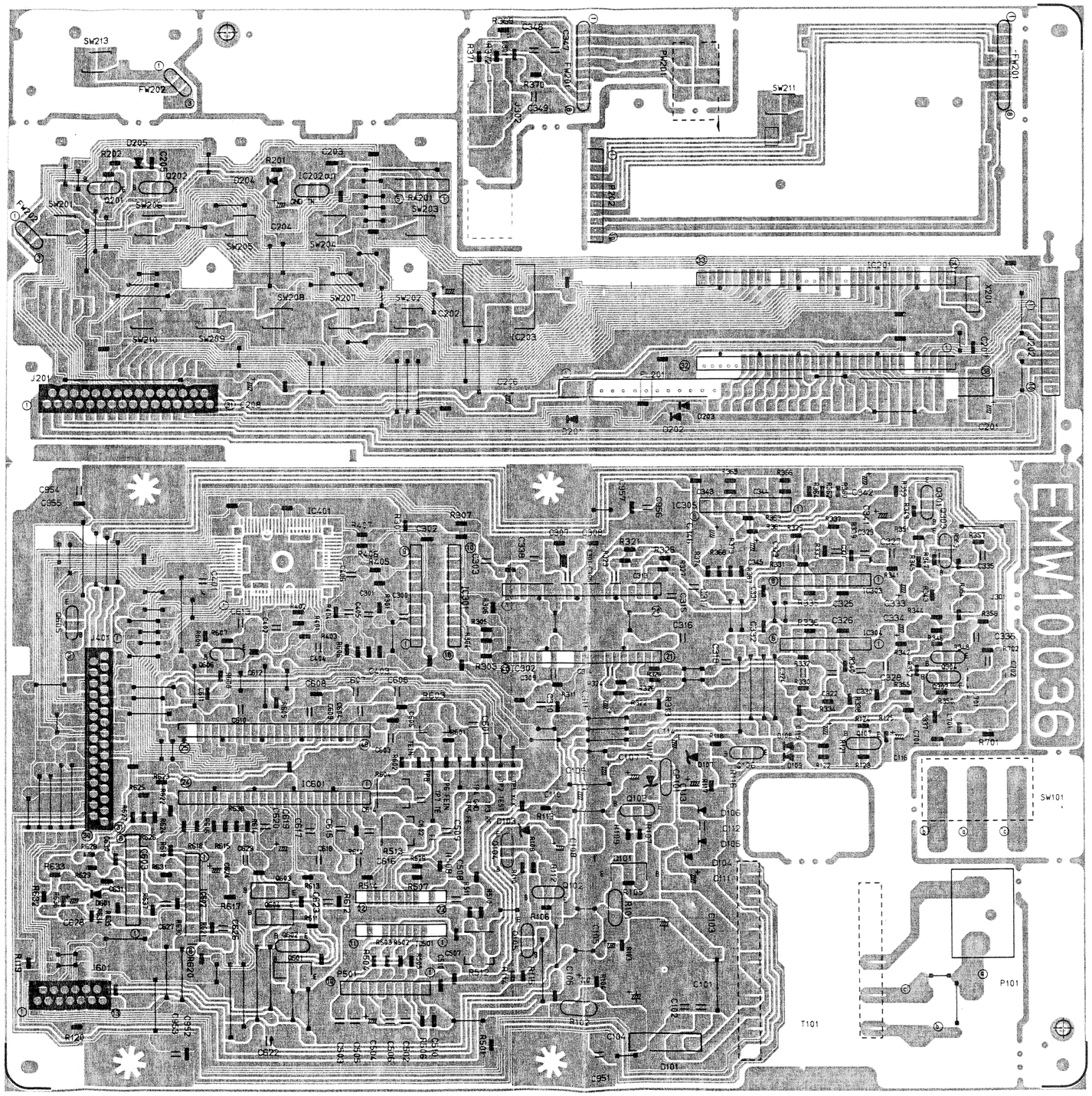
—How to Use Circuit Diagrams—

1. —— indicates the +B line.
2. - - - - indicates the −B line.
3. ▒▒ indicates signal path.
4. □ indicates voltage value.
5. Parts marked with ⚠ and those in the darkened area ▒▒ are parts for safety.
   Be sure to use one with the specified part number.
6. This is the standard circuit diagram. The circuits and circuit constants are subject to change for improvement without notice.

Block Diagram



Printed Circuit Board Ass'y



PARTS LIST

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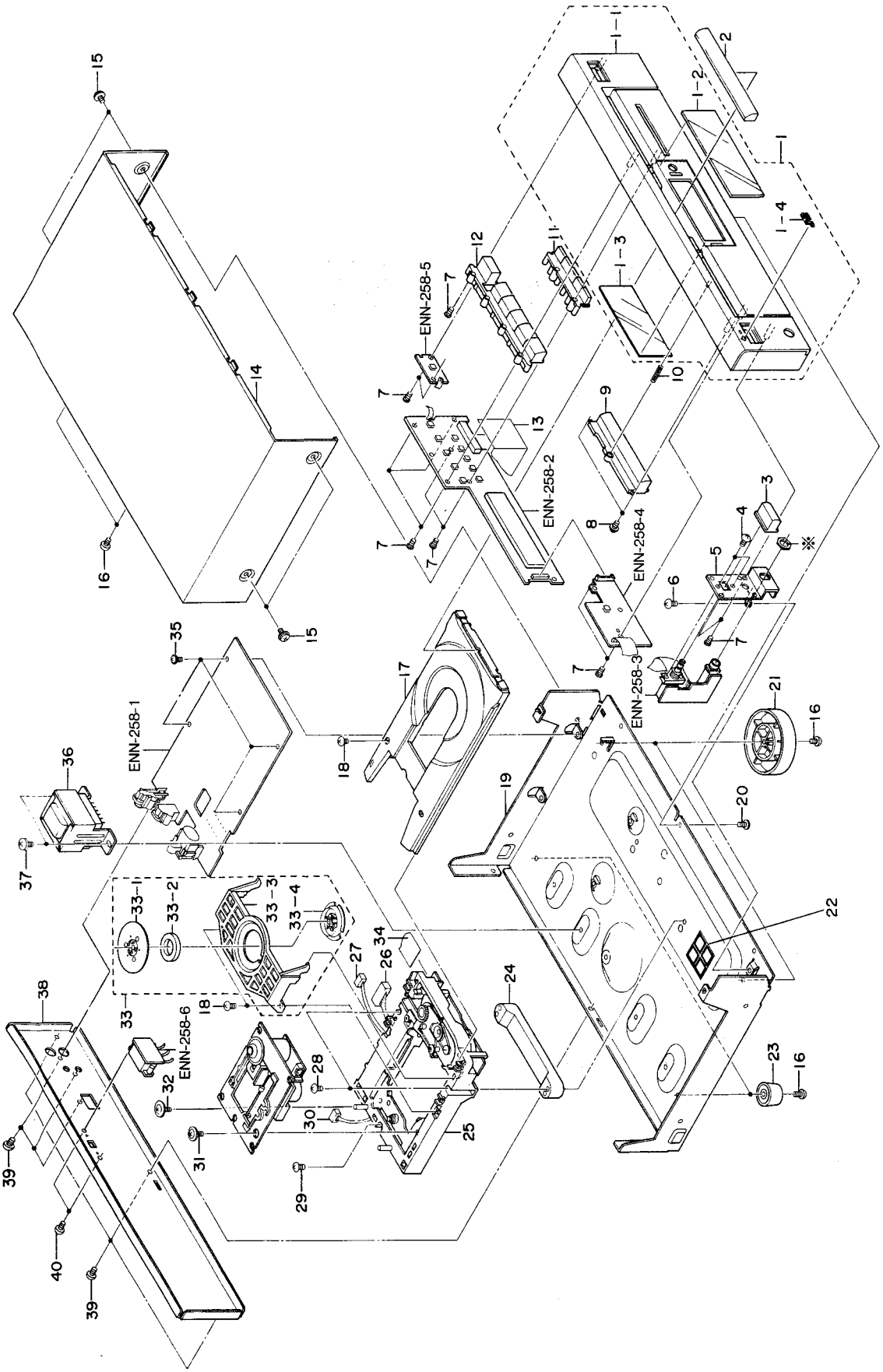
■ ENN-258 □ Main & Front PC Board Ass'y 2-7
Accessories List 2-10
Packing Materials and Part Numbers 2-11

General Exploded View and Parts List



■XL-V141TN Parts List

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XLV141TNE(S)	Front Panel Ass'y	1		
	1-1	E102356-004SS	Front Panel Ass'y	1		
	1-2	E307147-001SS	Window Screen	1		
	1-3	E406285-001SS	FL Screen	1		
	1-4	E72968-001	JVC Mark	1		
	2	E307156-001SS	Fitting	1		
	3	E406283-001SS	Push Button	1	Power	
	4	SBST3006Z	Screw	2		
	5	E406286-001SS	Head Phone Bracket	1		
	6	SBSG3006Z	Screw	1		
	7	SDSF2608Z	Screw	12		
	8	E72405-001	Screw	2		
	9	E307149-001SS	Button	1	Open / Close	
	10	E406333-001SS	Spring	1		
	11	E307153-001SS	Push Button	1	Random	
	12	E307151-003SS	Push Button	1	Play	
	13	EWR631G-10TTJ2	Flat Cable	1	31Pin (J201 - J401)	
	14	E206906-001	Metal Cover	1		
	15	E406308-001	Special Screw	4		
	16	SBST3008M	Screw	6		
	17	E12289-221SS	Tray	1		
	18	SBSF3008M	Screw	3		
	19	E102355-001SS	Chassis Base	1		
	20	SDSF3008M	Screw	1		
	21	E406282-001SS	Foot Ass'y	2	Front	
	22	E406507-001	Caution Label	1		Except J
	23	E47227-028	Foot	2	Rear	
	24	E307158-001SS	Stand	1		
	25	———	CD Mechanism Unit Ass'y	1	See page 2-5	
	26	EWS25A-B102J1	Socket Wire Ass'y	1	10 Pin	
	27	EWS254-B103J1	Socket Wire Ass'y	1	4Pin	
	28	SBST3025Z	Screw	2		
	29	SBST3008Z	Screw	1		
	30	EWS256-B102J1	Socket Wire	1	6Pin	
	31	E75871-002	Special Screw	1		
	32	E65923-003	Special Screw	1		
	33	E306837-001	Clamper Base Ass'y	1		
	33-1	E306835-001	Clamper	1		
	33-2	E74897-002	Magnet	1		
	33-3	E26756-001	Clamper Base	1		
	33-4	E306836-003	Yoke	1		
	34	EWR613E-10TTJ2	Flat Cable	1	13Pin (Mecha - J601)	
	35	SBSG3008CC	Screw	4		
⚠	36	ETP1000-70JAJ	Power Transformer	1		J , C
⚠		ETP1000-70LAJ	Power Transformer	1		U
⚠		ETP1000-70EAJ	Power Transformer	1		E , EF , A , G
⚠		ETP1000-70EAJBS	Power Transformer	1		BS
	37	E65389-002	Special Screw	2		
	38	E206904-004SS	Rear Panel	1		J
		E206904-012SS	Rear Panel	1		U
		E206904-005SS	Rear Panel	1		Except J , U
	—	E25096-755	Rating Label	1		C
	—	E25096-855	Rating Label	1	Made in Singapore	U
	—	E25096-856	Rating Label	1		U
	—	E25096-955	Rating Label	1		E , EF
	—	E26096-956F	Rating Label	1		G
	39	E73273-006	Special Screw	6		
	40	SBSF2608M	Screw	2		U
	—	E61029-005	Number Label	1		A , BS
	—	E72423-001	Caution Label	1		C

⚠: Safety Parts

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	—	E70891-001	Class 1 Label	1		U , E , EF , A , G , BS
	—	QZL1001-001	UL Label	1		J
	—	E45858-002	CSA Label	1		C
	—	E70028-001	Approval Label	1		E
	—	E70419-002F	F. Mark Label	1		G

⚠: Safety Parts

The Marks Designated Areas

J·····the U.S.A.
C·····Canada
A·····Australia
G·····Germany
BS·····the U.K.
E , EF·····Continental Europe
U·····Other Countries
No mark indicates all areas.

■XL-V142BK Parts List

Please refer to XL-V141TN parts list except following parts.

⚠	Item	Part Number	Part Name	Q'ty	Description	Areas
	1	EFP-XLV142BKE(S)	Front PaneL Ass'y	1		
	1-1	E102356-005SS	Front Panel	1		
	1-2	E307147-002SS	Window Screen	1		
	2	E307156-002SS	Fitting	1		
	3	E406283-002SS	Push Button	1	Power	
	9	E307149-002SS	Button	1	Open / Close	
	11	E307153-002SS	Push Button	1	Random	
	12	E307151-002SS	Push Button	1	Play	
	14	E206906-003	Metal Cover	1		
	17	E12289-222SS	Tray	1		
	21	E406282-002SS	Foot Ass'y	2	Front	
	38	E206904-006SS	Rear Panel	1		J
		E206904-008SS	Rear Panel	1		U
		E206904-007SS	Rear Panel	1		Except J , U
	—	E25096-759	Rating Label	1		C
	—	E25096-859	Rating Label	1	Made in Singapore	U
	—	E25096-860	Rating Label	1		U
	—	E25096-959	Rating Label	1		E , EF
	—	E25096-960F	Rating Label	1		G

⚠: Safety Parts

The Marks Designated Areas

J·····the U.S.A.
C·····Canada
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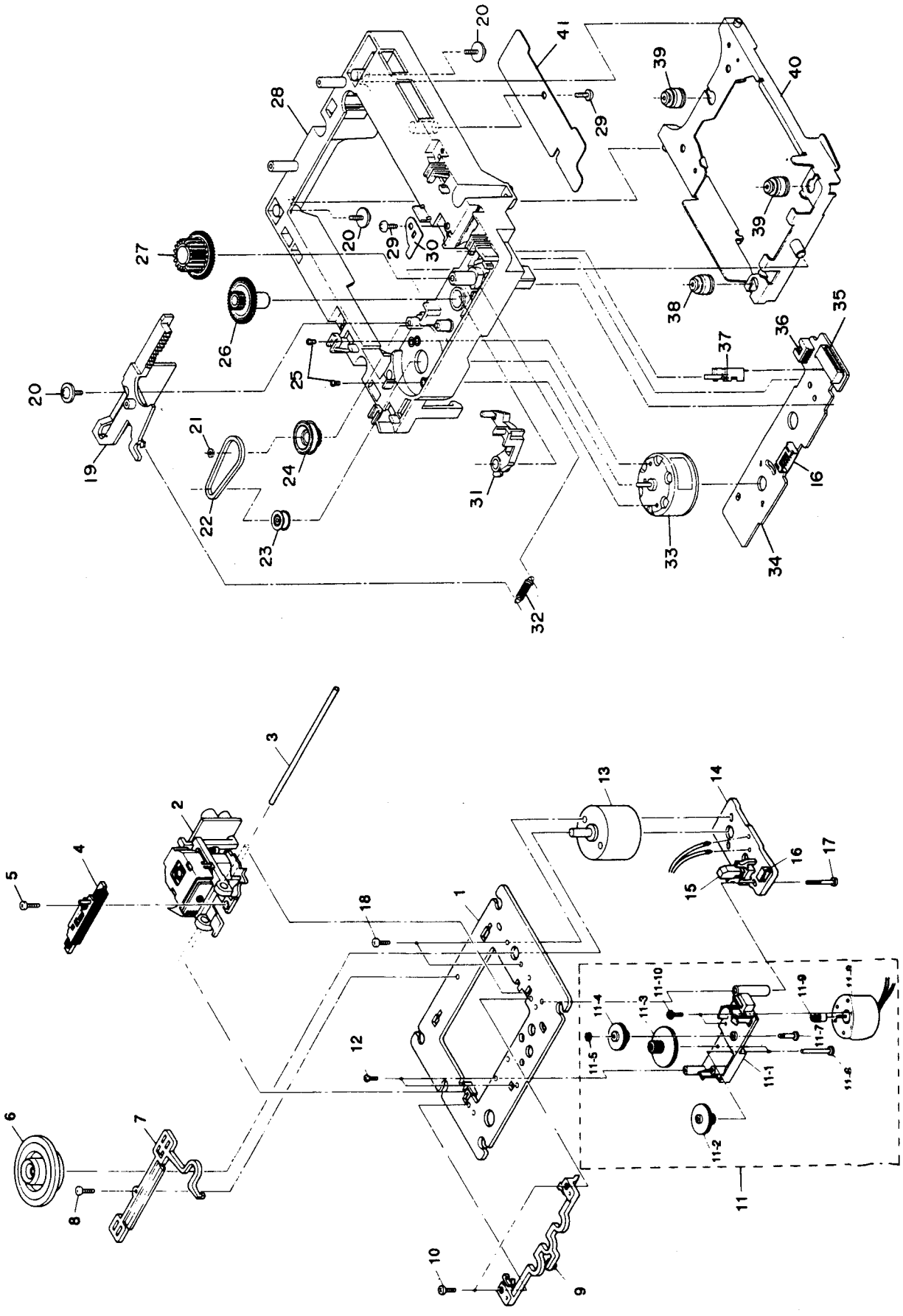
No mark indicates all areas.

CD Mechanism Ass'y and Parts List



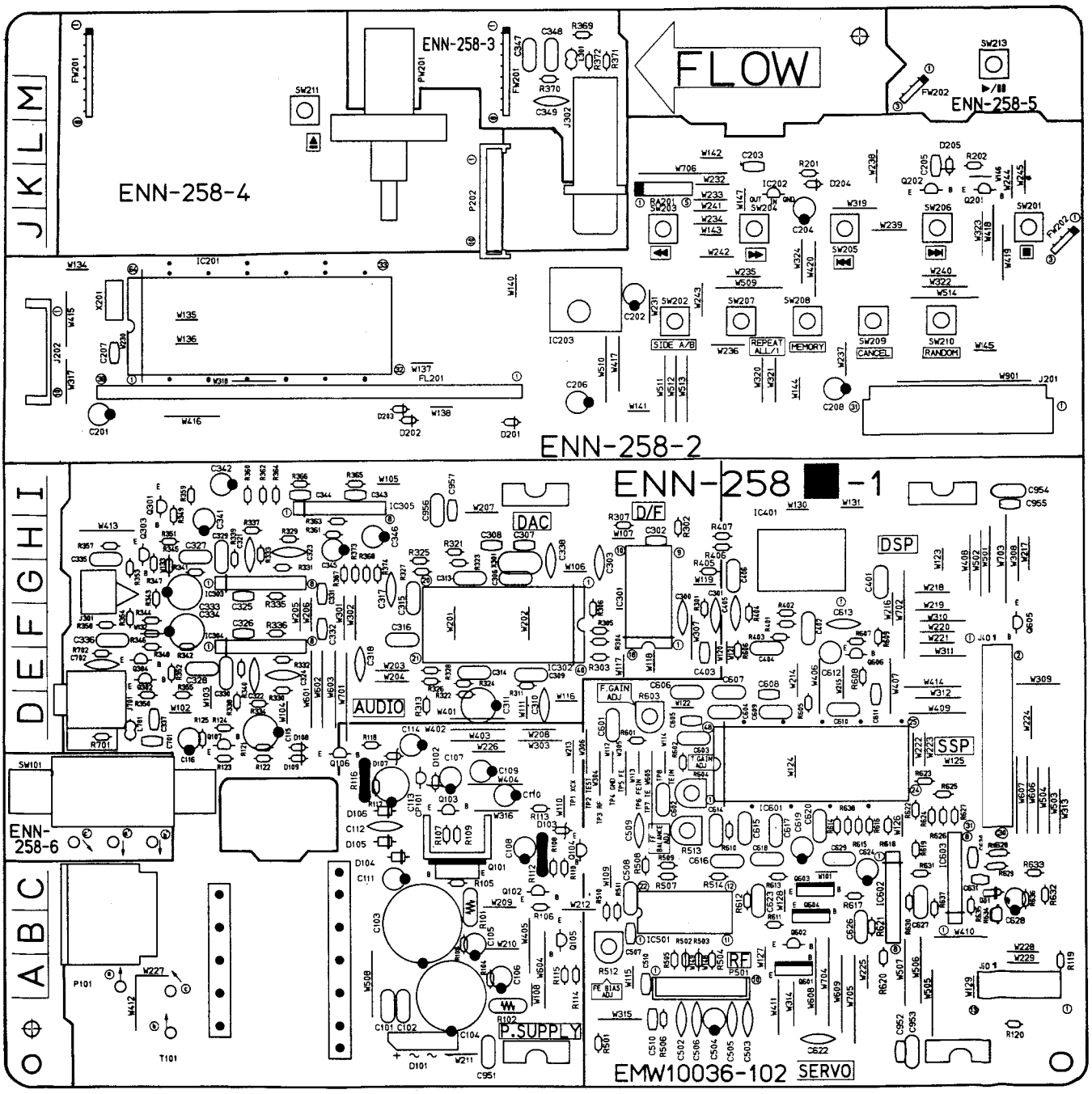
■Parts List

Item	Part Number	Part Name	Q'ty	Description	Areas
1	E26487-003	Mechanism Base	1		
2	OPTIMA-5S	Pick up Ass'y	1		
3	E74930-003	Shaft	1		
4	E306282-001	Rack Ass'y	1		
5	SPSH2050M	Screw	1		
6	E406064-002	Turn Table Ass'y	1		
7	E306275-003	Support	1		
8	SDST2005Z	Screw	1		
9	E306277-001	Holder	1		
10	SDST2004Z	Screw	2		
11	SE10351-11	Gear Ass'y	1		
11-1	E306276-001	Gear Base	1		
11-2	E75444-001	Gear	1		
11-3	E75443-001	Gear	1		
11-4	E75445-001	Gear	1		
11-5	WDM163550	Slit Washer	1		
11-6	E75494-003	Shaft	2		
11-7	E75494-002	Shaft	1		
11-8	HKN-3A6RDNV	Feed Motor	1		
11-9	E75493-001	Pinion Gear	1		
11-10	LPSH1735Z	Screw	2		
12	E72713-001	Screw	2		
13	E74539-001B	Spindle Motor	1		
14	E12114-005(S)	Circuit Board	1		
15	ESB1100-005	Leaf Switch	1	S001	
16	EMV5109-006B	6P Plug Ass'y	2	P011	
17	E75832-001	Screw	1		
18	SDSP2003N	Screw	2		
19	E306834-001	Cam	1		
20	E65923-003	Screw	3		
21	E72024-001	Speed Nut	1		
22	E75950-002	Belt	1		
23	E75984-001	Motor Pulley	1		
24	E75985-001	Gear (1)	1		
25	SPSK2640Z	Screw	2		
26	E75986-002	Gear (2)	1		
27	E75987-001	Gear (3)	1		
28	E12288-002	Loading Base	1		
29	SBSF3008Z	Screw	1		
30	E75988-001	Plate	1		
31	E306833-001	Lever	1		
32	E75989-001	Spring	1		
33	RF-500TB-12560	Loading Motor	1		
34	EMW10045-001(S)	Circuit Board	1		
35	EMV7123-013R	Connector	1	13Pin	
36	EMV5109-004B	Plug Ass'y	1	4Pin	
37	ESS1200-002	Switch	1		
38	E75609-002	Insulator	1		
39	E75609-001	Insulator	2		
40	E307087-001	Elevator Base Ass'y	1		

Printed Circuit Board Ass'y and Parts List

■ENN-258 □ Main & Front PC Board Ass'y

Note : ENN-258 □ varies according to the areas employed. See note (1) when placing an order.



Note (1)

PC Board Ass'y	Designated Areas
ENN-258 [A]	the U.S.A. , Canada
ENN-258 [B]	Continental Europe
ENN-258 [C]	Germany
ENN-258 [D]	Australia
ENN-258 [E] BS	the U.K.
ENN-258 [F]	Other Countries

Transistors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	Q101	2SB1187(E,F)	SILICON ROHM	
	Q102	2SC2060(Q,R)	SILICON ROHM	
	Q103	2SD1302(S,T)	SILICON MATSUSHITA	
	Q104	2SA933S(R,S)	SILICON ROHM	
	Q105	2SD1302(S,T)	SILICON MATSUSHITA	
	Q106	2SA933S(R,S)	SILICON ROHM	
	Q107	2SA933S(R,S)	SILICON ROHM	
	Q201	DTA114YS	SILICON ROHM	
	Q202	DTC114YS	SILICON ROHM	
	Q303	2SD1302(S,T)	SILICON MATSUSHITA	
	Q304	2SD1302(S,T)	SILICON MATSUSHITA	
	Q601	2SD2037(E,F)	SILICON ROHM	
	Q602	2SA934(Q,R)	SILICON ROHM	
	Q603	2SD2037(E,F)	SILICON ROHM	
	Q604	2SB1357(E,F)	SILICON ROHM	
	Q605	DTC144ES	SILICON ROHM	
	Q606	2SC1740S(R,S)	SILICON ROHM	

⚠ : SAFETY PARTS

I.C.s

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	IC201	MN171202JNJ	I.C. MATSUSHITA	
	IC202	MN1281(P,Q)	I.C. MATSUSHITA	
	IC301	CXD2554P	I.C. 1680	
	IC302	JCE4501	I.C. MATSUSHITA	
	IC303	M5218AL	I.C. MITSUBISHI	
	IC304	M5218AL	I.C. MITSUBISHI	
	IC305	VC4580L	I.C. DAINICHI	
	IC401	CXD2500Q	I.C. 1680	
	IC501	CXA1471S	I.C. 1680	
	IC601	CXA1372S	I.C. 1680	
	IC602	STA341M(A)	I.C. SANKEN	
	IC603	M5218AL	I.C. MITSUBISHI	

⚠ : SAFETY PARTS

Diodes

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
⚠	D101	S1VB20F	SILICON SINDENGEN	
	D102	MTZ5.6JB	ZENER ROHM	
	D103	MTZ6.2JC	ZENER ROHM	
	D104	1SR139-200	SILICON ROHM	
	D105	1SR139-200	SILICON ROHM	
	D106	1SR139-200	SILICON ROHM	
	D107	MTZ33JC	ZENER ROHM	
	D108	1SS133	SILICON ROHM	
	D109	1SS133	SILICON ROHM	
	D201	1SS119	SILICON HITACHI	
	D202	1SS119	SILICON HITACHI	
	D203	1SS119	SILICON HITACHI	
	D204	1SS133	SILICON ROHM	
	D205	1SS133	SILICON ROHM	
	D601	1SS133	SILICON ROHM	

⚠ : SAFETY PARTS

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C101	QFV81HJ-104	0.1MF 50V T.FILM	
	C102	QFV81HJ-104	0.1MF 50V T.FILM	
	C103	QET81CM-338	3300MF 16V ELECTRO	
	C104	QET81EM-228	2200MF 25V ELECTRO	
	C105	QET81CM-227	220MF 16V ELECTRO	

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	C106	QET81CM-227	220MF 16V ELECTRO	
	C107	QET81HM-225	2.2MF 50V ELECTRO	
	C108	QET81HM-225	2.2MF 50V ELECTRO	
	C109	QET80JM-227	220MF 6.3V ELECTRO	
	C110	QET81AM-476	47MF 10V ELECTRO	
	C111	QET81EM-107	100MF 25V ELECTRO	
	C112	QCF21HP-223	0.022MF 50V CERAMIC	
	C113	QET81HM-107	100MF 50V ELECTRO	
	C114	QET81HM-475	4.7MF 50V ELECTRO	
	C115	QET81CM-227	220MF 16V ELECTRO	
	C116	QET81CM-226	22MF 16V ELECTRO	
	C201	QET81HM-475	4.7MF 50V ELECTRO	
	C203	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C204	QER50JM-107	100MF 6.3V ELECTRO	
	C205	QCBB1HK-331	330PF 50V CERAMIC	
	C206	QET81HM-475	4.7MF 50V ELECTRO	
	C207	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C208	QET81AM-476	47MF 10V ELECTRO	
	C300	QCF21HP-223	0.022MF 50V CERAMIC	
	C302	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C303	QCF21HP-223	0.022MF 50V CERAMIC	
	C306	QFV81HJ-104	0.1MF 50V T.FILM	
	C307	QCT30CH-120	12PF 50V CERAMIC	
	C308	QCT30CH-3R3	3.3PF 50V CERAMIC	
	C309	QFV81HJ-104	0.1MF 50V T.FILM	
	C310	QCS21HJ-5R0	5PF 50V CERAMIC	
	C311	QET80JM-477	470MF 6.3V ELECTRO	
	C313	QFV81HJ-104	0.1MF 50V T.FILM	
	C314	QFV81HJ-104	0.1MF 50V T.FILM	
	C315	QFV81HJ-104	0.1MF 50V T.FILM	
	C316	QFV81HJ-104	0.1MF 50V T.FILM	
	C317	QCS21HJ-221	220PF 50V CERAMIC	
	C318	QCS21HJ-221	220PF 50V CERAMIC	
	C321	QCS21HJ-121	120PF 50V CERAMIC	
	C322	QCS21HJ-121	120PF 50V CERAMIC	
	C323	QCS21HJ-121	120PF 50V CERAMIC	
	C324	QCS21HJ-121	120PF 50V CERAMIC	
	C325	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C326	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C327	QFN81HJ-392	3900PF 50V MYLAR	
	C328	QFN81HJ-392	3900PF 50V MYLAR	
	C329	QFN81HJ-223	0.022MF 50V MYLAR	
	C330	QFN81HJ-223	0.022MF 50V MYLAR	
	C331	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C332	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C333	QET81EM-107	100MF 25V ELECTRO	
	C334	QET81EM-107	100MF 25V ELECTRO	
	C335	QFN81HJ-562	5600PF 50V MYLAR	
	C336	QFN81HJ-562	5600PF 50V MYLAR	
	C337	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C338	QCS21HJ-470	47PF 50V CERAMIC	
	C341	QET81HM-475	4.7MF 50V ELECTRO	
	C342	QET81HM-475	4.7MF 50V ELECTRO	
	C343	QCBB1HK-471	470PF 50V CERAMIC	
	C344	QCBB1HK-471	470PF 50V CERAMIC	
	C345	QET81CM-476	47MF 16V ELECTRO	
	C346	QET81CM-476	47MF 16V ELECTRO	
	C347	QFN81HJ-103	0.01MF 50V MYLAR	
	C348	QFN81HJ-103	0.01MF 50V MYLAR	
	C349	QCF21HP-102	1000PF 50V CERAMIC	
	C351	QCF21HP-102	1000PF 50V CERAMIC	
	C352	QCF21HP-102	1000PF 50V CERAMIC	
	C401	QCZ0202-155	1.5MF 25V CERAMIC	
	C402	QFN81HJ-473	0.047MF 50V MYLAR	
	C403	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C404	QFN81HJ-152	1500PF 50V MYLAR	
	C405	QCF21HP-103	0.01MF 50V CERAMIC	
	C406	QCZ0202-155	1.5MF 25V CERAMIC	
	C501	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C502	QCS21HJ-100	10PF 50V CERAMIC	
	C503	QCS21HJ-100	10PF 50V CERAMIC	
	C504	QET81AM-476	47MF 10V ELECTRO	
	C505	QCS21HJ-820	82PF 50V CERAMIC	
	C506	QCS21HJ-101	100PF 50V CERAMIC	
	C507	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C508	QCZ0202-155	1.5MF 25V CERAMIC	
	C509	QCS21HJ-180	18PF 50V CERAMIC	
	C510	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C601	QFN81HJ-182	1800PF 50V MYLAR	
	C603	QFN81HJ-222	2200PF 50V MYLAR	
	C604	QFN81HJ-222	2200PF 50V MYLAR	
	C605	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C606	QFN81HJ-333	0.033MF 50V MYLAR	
	C607	QFN81HJ-103	0.01MF 50V MYLAR	
	C608	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C609	QFN81HJ-333	0.033MF 50V MYLAR	
	C610	QCZ0202-155	1.5MF 25V CERAMIC	
	C611	QCHB1EZ-223	0.022MF 25V CERAMIC	
	C612	QEN51HM-224	0.22MF 50V NON POLE	
	C613	QCS21HJ-471	470PF 50V CERAMIC	
	C614	QFN81HJ-104	0.1MF 50V MYLAR	
	C615	QFN81HJ-333	0.033MF 50V MYLAR	
	C616	QFN81HJ-473	0.047MF 50V MYLAR	
	C617	QFN81HJ-473	0.047MF 50V MYLAR	
	C618	QFN81HJ-473	0.047MF 50V MYLAR	

Capacitors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	C619	QETB1HM-335	3.3MF	50V	ELECTRO	
	C620	QFN81HJ-104	0.1MF	50V	MYLAR	
	C622	QCF21HP-223	0.022MF	50V	CERAMIC	
	C623	QFN81HJ-563	0.056MF	50V	MYLAR	
	C624	QETB1EM-106	10MF	25V	ELECTRO	
	C626	QFN81HJ-183	0.018MF	50V	MYLAR	
	C627	QFN81HJ-103	0.01MF	50V	MYLAR	
	C628	QETB1HM-475	4.7MF	50V	ELECTRO	
	C629	QFN81HJ-333	0.033MF	50V	MYLAR	
	C630	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C631	QCHB1EZ-223	0.022MF	25V	CERAMIC	
	C701	QCBB1HK-101	100PF	50V	CERAMIC	
	C702	QCS21HJ-100	10PF	50V	CERAMIC	
	C951	QCZ0202-155	1.5MF	25V	CERAMIC	
	C953	QCS21HJ-180	18PF	50V	CERAMIC	
	C954	QCF21HP-472	4700PF	50V	CERAMIC	

⚠ : SAFETY PARTS

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
⚠	R101	PTH61G30BD2R2N			FUSIBLE RE	SI
⚠	R102	PTH61G30BD2R2N			FUSIBLE RE	SI
	R103	QRD167J-104	100K	1/6W	CARBON	
	R104	QRD167J-104	100K	1/6W	CARBON	
	R105	QRD167J-222	2.2K	1/6W	CARBON	
	R106	QRD167J-222	2.2K	1/6W	CARBON	
	R107	QRD167J-221	220	1/6W	CARBON	
	R108	QRD167J-221	220	1/6W	CARBON	
	R109	QRD167J-221	220	1/6W	CARBON	
	R110	QRD167J-221	220	1/6W	CARBON	
⚠	R112	QRZ0077-100	10	1/4W	FUSIBLE	
	R113	QRD167J-331	330	1/6W	CARBON	
	R114	QRD167J-202	2K	1/6W	CARBON	
	R115	QRD167J-103	10K	1/6W	CARBON	
⚠	R116	QRZ0077-560	56	1/4W	FUSIBLE	
	R117	QRD167J-202	2K	1/6W	CARBON	
	R118	QRD167J-121	120	1/6W	CARBON	
	R119	QRD167J-152	1.5K	1/6W	CARBON	
	R120	QRD167J-152	1.5K	1/6W	CARBON	
	R121	QRD167J-221	220	1/6W	CARBON	
	R122	QRD167J-221	220	1/6W	CARBON	
	R123	QRD167J-822	8.2K	1/6W	CARBON	
	R124	QRD167J-683	68K	1/6W	CARBON	
	R125	QRD167J-221	220	1/6W	CARBON	
	R201	QRD167J-152	1.5K	1/6W	CARBON	
	R202	QRD167J-472	4.7K	1/6W	CARBON	
	R301	QRD167J-101	100	1/6W	CARBON	
	R302	QRD167J-472	4.7K	1/6W	CARBON	
	R303	QRD167J-102	1K	1/6W	CARBON	
	R304	QRD167J-102	1K	1/6W	CARBON	
	R305	QRD167J-102	1K	1/6W	CARBON	
	R306	QRD167J-102	1K	1/6W	CARBON	
	R307	QRD167J-472	4.7K	1/6W	CARBON	
	R311	QRD167J-221	220	1/6W	CARBON	
	R313	QRD167J-101	100	1/6W	CARBON	
	R321	QRD167J-183	18K	1/6W	CARBON	
	R322	QRD167J-183	18K	1/6W	CARBON	
	R323	QRD167J-183	18K	1/6W	CARBON	
	R324	QRD167J-183	18K	1/6W	CARBON	
	R325	QRD167J-183	18K	1/6W	CARBON	
	R326	QRD167J-183	18K	1/6W	CARBON	
	R327	QRD167J-183	18K	1/6W	CARBON	
	R328	QRD167J-183	18K	1/6W	CARBON	
	R329	QRD167J-273	27K	1/6W	CARBON	
	R330	QRD167J-273	27K	1/6W	CARBON	
	R331	QRD167J-273	27K	1/6W	CARBON	
	R332	QRD167J-273	27K	1/6W	CARBON	
	R333	QRD167J-333	33K	1/6W	CARBON	
	R334	QRD167J-333	33K	1/6W	CARBON	
	R335	QRD167J-333	33K	1/6W	CARBON	
	R336	QRD167J-333	33K	1/6W	CARBON	
	R337	QRD167J-561	560	1/6W	CARBON	
	R338	QRD167J-561	560	1/6W	CARBON	
	R339	QRD167J-511	510	1/6W	CARBON	
	R340	QRD167J-511	510	1/6W	CARBON	
	R341	QRD167J-183	18K	1/6W	CARBON	
	R342	QRD167J-183	18K	1/6W	CARBON	
	R343	QRD167J-273	27K	1/6W	CARBON	
	R344	QRD167J-273	27K	1/6W	CARBON	
	R347	QRD167J-331	330	1/6W	CARBON	
	R348	QRD167J-331	330	1/6W	CARBON	
	R351	QRD167J-103	10K	1/6W	CARBON	
	R352	QRD167J-103	10K	1/6W	CARBON	
	R353	QRD167J-151	150	1/6W	CARBON	
	R354	QRD167J-151	150	1/6W	CARBON	
	R355	QRD167J-473	47K	1/6W	CARBON	
	R356	QRD167J-560	56	1/6W	CARBON	
	R357	QRD167J-561	560	1/6W	CARBON	
	R358	QRD167J-561	560	1/6W	CARBON	
	R359	QRD167J-473	47K	1/6W	CARBON	
	R360	QRD167J-473	47K	1/6W	CARBON	
	R361	QRD167J-103	10K	1/6W	CARBON	
	R362	QRD167J-103	10K	1/6W	CARBON	
	R363	QRD167J-273	27K	1/6W	CARBON	
	R364	QRD167J-273	27K	1/6W	CARBON	

Resistors

⚠	ITEM	PART NUMBER	DESCRIPTION			AREA
	R365	QRD167J-562	5.6K	1/6W	CARBON	
	R366	QRD167J-562	5.6K	1/6W	CARBON	
	R367	QRD167J-271	270	1/6W	CARBON	
	R368	QRD167J-271	270	1/6W	CARBON	
	R369	QRD167J-680	68	1/6W	CARBON	
	R370	QRD167J-680	68	1/6W	CARBON	
	R371	QRD167J-390	39	1/6W	CARBON	
	R372	QRD167J-390	39	1/6W	CARBON	
	R373	QRD167J-271	270	1/6W	CARBON	
	R374	QRD167J-271	270	1/6W	CARBON	
	R401	QRD167J-332	3.3K	1/6W	CARBON	
	R402	QRD167J-332	3.3K	1/6W	CARBON	
	R403	QRD167J-103	10K	1/6W	CARBON	
	R404	QRD167J-113	11K	1/6W	CARBON	
	R405	QRD167J-102	1K	1/6W	CARBON	
	R406	QRD167J-102	1K	1/6W	CARBON	
	R407	QRD167J-102	1K	1/6W	CARBON	
	R501	QRD167J-102	1K	1/6W	CARBON	
	R504	QRD167J-183	18K	1/6W	CARBON	
	R505	QRD167J-183	18K	1/6W	CARBON	
	R506	QRD167J-121	120	1/6W	CARBON	
	R507	QRD167J-562	5.6K	1/6W	CARBON	
	R508	QRD167J-272	2.7K	1/6W	CARBON	
	R509	QRD167J-472	4.7K	1/6W	CARBON	
	R510	QRD167J-102	1K	1/6W	CARBON	
	R511	QRD167J-103	10K	1/6W	CARBON	
	R512	QVPA601-203A	20K		VARIABLE	
	R513	QVPA601-203A	20K		VARIABLE	
	R514	QRD167J-223	22K	1/6W	CARBON	
	R601	QRD167J-472	4.7K	1/6W	CARBON	
	R602	QRD167J-472	4.7K	1/6W	CARBON	
	R603	QVPA601-203A	20K		VARIABLE	
	R604	QVPA601-203A	20K		VARIABLE	
	R605	QRD167J-102	1K	1/6W	CARBON	
	R606	QRD167J-104	100K	1/6W	CARBON	
	R607	QRD167J-103	10K	1/6W	CARBON	
	R608	QRD167J-183	18K	1/6W	CARBON	
	R609	QRD167J-683	68K	1/6W	CARBON	
	R610	QRD167J-224	220K	1/6W	CARBON	
	R611	QRD167J-2R2	2.2	1/6W	CARBON	
	R612	QRD167J-683	68K	1/6W	CARBON	
	R613	QRD167J-104	100K	1/6W	CARBON	
	R614	QRD167J-2R2	2.2	1/6W	CARBON	
	R615	QRD167J-224	220K	1/6W	CARBON	
	R616	QRD167J-274	270K	1/6W	CARBON	
	R617	QRD167J-333	33K	1/6W	CARBON	
	R618	QRD167J-514	510K	1/6W	CARBON	
	R619	QRD167J-2R2	2.2	1/6W	CARBON	
	R620	QRD167J-183	18K	1/6W	CARBON	
	R621	QRD167J-363	36K	1/6W	CARBON	
	R622	QRD167J-124	120K	1/6W	CARBON	
	R623	QRD167J-472	4.7K	1/6W	CARBON	
	R626	QRD167J-153	15K	1/6W	CARBON	
	R627	QRD167J-333	33K	1/6W	CARBON	
	R628	QRD167J-752	7.5K	1/6W	CARBON	
	R629	QRD167J-752	7.5K	1/6W	CARBON	
	R630	QRD167J-333	33K	1/6W	CARBON	
	R631	QRD167J-470	47	1/6W	CARBON	
	R632	QRD167J-513	51K	1/6W	CARBON	
	R633	QRD167J-513	51K	1/6W	CARBON	
	R634	QRD167J-683	68K	1/6W	CARBON	
	R635	QRD167J-683	68K	1/6W	CARBON	
	R636	QRD167J-684	680K	1/6W	CARBON	
	R637	QRD167J-470	47	1/6W	CARBON	
	R638	QRD167J-184	180K	1/6W	CARBON	
	R701	QRD167J-471	470	1/6W	CARBON	
	RA201	QRB045J-473	47K	1/8W	R.NETWORK	

⚠ : SAFETY PARTS

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
		E306805-010	SPACER	
		E306951-002	FL HOLDER	
		E3400-431	SPACER	
		E70306-001	HEAT SINK	
		E70859-001	EARTH PLATE	
		E75464-001	EARTH PLATE	
		SBSG3008CC	SCREW	
		EMW10036-102	CIRCUIT BOARD	A
		EMW10036-102	CIRCUIT BOARD	B
		EMW10036-102	CIRCUIT BOARD	C
		EMW10036-102	CIRCUIT BOARD	D
		EMW10036-102BS	CIRCUIT BOARD	EBS
		EMW10036-102	CIRCUIT BOARD	F
	J201	VMC0161-R31	CONNECTOR(31PIN)	
	J202	EMV7120-010	CONNECTOR(10PIN)	
	J301	EMN00TV-214AJ2	2P PIN JACK	
	J302	QMS6302-131	HEADPHONE JACK	
	J401	VMC0161-031	CONNECTOR(31PIN)	
	J601	VMC0161-013	CONNECTOR(13PIN)	
	J701	QMS3501-020	MINI JACK	

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	L301	EQL4004-1R0	INDUCTOR	
	L701	EQL4004-1R0	INDUCTOR	
	P101	QMCB001-E01H	AC SOCKET	A
	P101	QMCB001-E02H	AC SOCKET	B
	P101	QMCB001-E02H	AC SOCKET	C
	P101	QMCB001-E02H	AC SOCKET	D
	P101	QMCB001-E02HBS	AC SOCKET	EBS
	P101	QMCB001-E02H	AC SOCKET	F
	P202	EMV5120-010	PLUG ASSY	
	P501	EMV5109-010A	PLUG ASSY	
	X201	ECX0060-000EM	RESONATOR	
	X301	ECX0169-344KL	RESONATOR	
⚠	CP101	ICP-N15	I.C. PROTECTOR	
	FL201	ELU0001-114	FL TUBE	
	FW201	EWR38B-15SST	FLAT WIRE(8PIN)	

Others

⚠	ITEM	PART NUMBER	DESCRIPTION	AREA
	FW202	EWR33B-08SST	FLAT WIRE(3PIN)	
	SW101	QSS1L22-E01	SLIDE SWITCH(VOL.SELECTOR)	F
	SW201	ESP0001-018	TACT SWITCH(STOP/CLEAR)	
	SW202	ESP0001-018	TACT SWITCH(SIDE A/B)	
	SW203	ESP0001-018	TACT SWITCH(AUTO EDIT)	
	SW204	ESP0001-018	TACT SWITCH(PROGRAM EDIT)	
	SW205	ESP0001-018	TACT SWITCH(R.SKIP)	
	SW206	ESP0001-018	TACT SWITCH(F.SKIP)	
	SW207	ESP0001-018	TACT SWITCH(REPEAT ALL/1)	
	SW208	ESP0001-018	TACT SWITCH(MEMORY)	
	SW209	ESP0001-018	TACT SWITCH(CANCEL)	
	SW210	ESP0001-018	TACT SWITCH(RANDOM)	
	SW211	ESP0001-018	TACT SWITCH(OPEN/CLOSE)	
	SW212	QST4101-E20	PUSH SWITCH(POWER)	
	SW213	ESP0001-018	TACT SWITCH(PLAY/PAUSE)	

⚠ : SAFETY PARTS

Accessories List

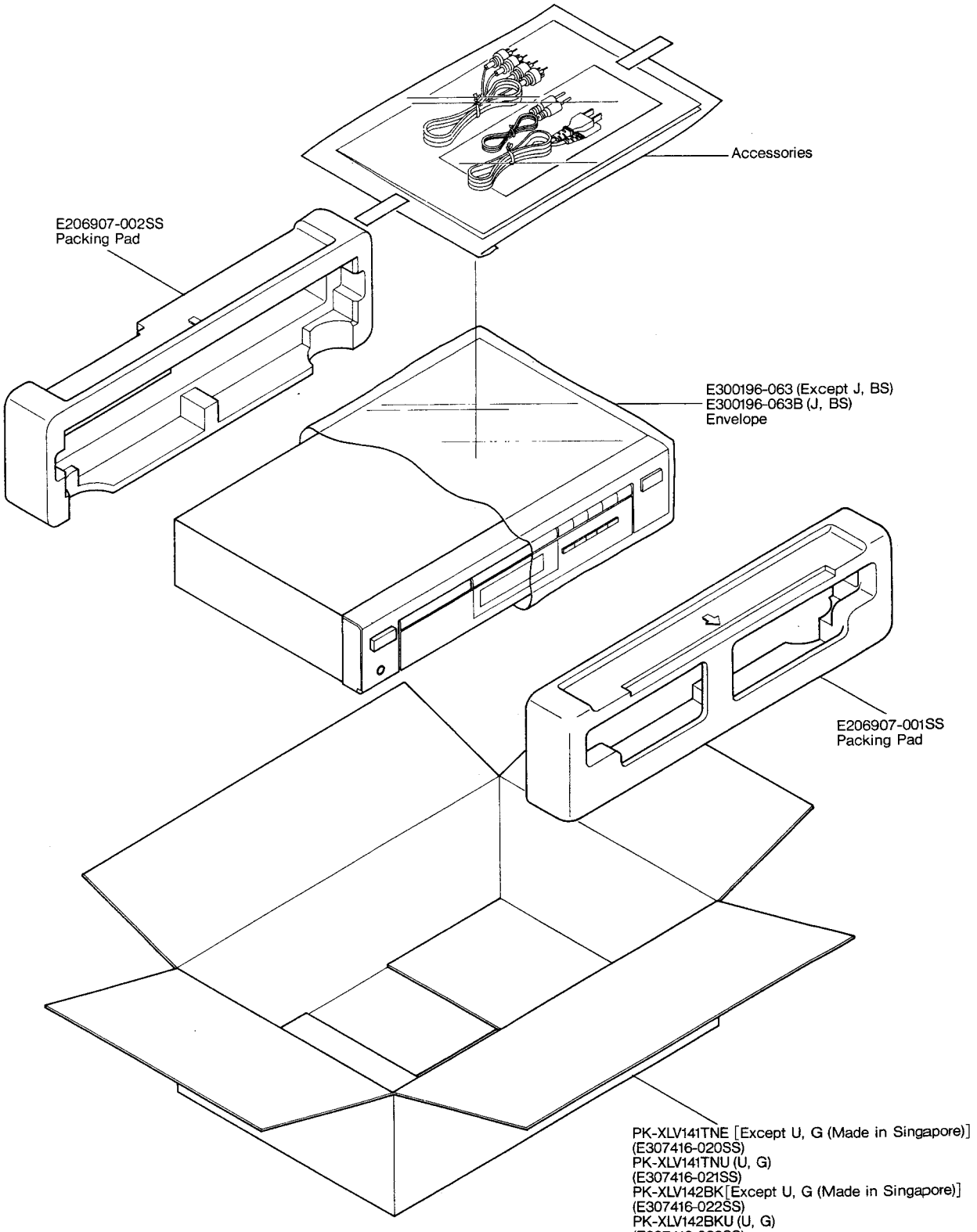
⚠	Part Number	Part Name	Q'ty	Description	Areas
	E30580-1655A	Instruction Book	1		J
	E30580-1656A	Instruction Book	1		Except J, BS
	E30580-1656ABS	Instruction Book	1		BS
	BT-20025K	Warranty Card	1		C
	BT20060	Warranty Card	1		BS
	BT-20117	Warranty Card	1		G
	BT-20122	Warranty Card	1		A
	BT-20122-1	Warranty Card	1		A
	BT-20047E	Warranty Card	1		J
	BT-20108A	Service Information	1		J
	BT-20044G	Safety Instruction Sheet	1		J
	BT20071A	Service Center List	1		C
	BT20066A	EEC Agency	1		BS
	E43486-340A	Safety Sheet	1		BS
	EWP302-011	Signal Cord	1		
	EWP805-001	1P Plug Cord	1		
⚠	E04056	Siemens Plug	1		U
	E35497-022	Caution Sheet	1	220V	U
⚠	QMP1240-183J5	Power Cord	1		J, C
⚠	QMP2570-183	Power Cord	1		A
⚠	QMP7530-183	Power Cord	1		U
⚠	QMP3950-183E	Power Cord	1		E, EF, G
⚠	QMP5510-183BS	Power Cord	1		BS
	E66416-003	Envelope	1	for Warranty Card	J
	E30O196-010	Envelope	1		Except J, BS
	E30O196-010B	Envelope	1		J, BS

⚠: Safety Parts

The Marks Designated Areas

J·····the U.S.A.
C·····Canada
A·····Australia
G·····Germany
BS·····the U.K.
E, EF·····Continental Europe
U·····Other Countries
No mark indicates all areas.

Packing Materials and Part Numbers



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